

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER AND R. DAWSON HALL, Editors.

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Where the Coal Man Needs Enlightenment

WE ARE prone to say that if the people of the country knew more about the coal industry they would have less complaint to make—that the problem is to educate the public to the problems and needs of coal and thus to promote better feeling. There is, however, another side to the question: The education of the coal man to the problems and needs of other industries. We who would have the consumer of coal know that the coal man does not repose on a bed of roses and who appreciate the fundamental character of the coal industry may profitably study the troubles of other lines of industry. In such a direction would the Secretary of Commerce turn the attention of the coal producers, together with others engaged in mining both metals and oil.

Those who are directly in the business of exporting coal and coke other than to Canada, which is part and parcel of our domestic trade, are quite few in number, and the tonnage, even of the fields from which it comes, is but a small fraction of the whole. The fondest hopes of the most optimistic do not envisage an offshore movement of coal in excess of some 5 per cent of our total production, yet 25,000,000 tons a year sold abroad would lighten the competition and make more profitable the coal trade within our borders. Every coal producer and distributor therefore has an interest in our export coal trade, whether he be in position to supply the tonnage or be in the interior.

But there is another angle to the export market for American goods that brings the matter closer home to every one in the coal business. If, in round numbers, some 10 per cent of the goods and materials we can produce can be sold outside our borders, business and industry are prosperous, and when the markets of the world are paralyzed and we cannot sell our surplus, business and industry are flat. In 1920 there was exported from the United States around 10,200,000 gross tons of iron and steel products, representing approximately 23,000,000 net tons of coal, aside from that consumed in transportation. Of cement, sugar, copper products, vegetable products, condensed milk, paper, gunpowder and other manufactured goods requiring coal for their production there were exported some 2,500,000 gross tons, representing not less than as many net tons of coal. In other words, the quantity of coal shipped from this country by sea probably was equalled by the coal exported in the form of manufactured and semi-manufactured products. Every coal operator in the United States is interested in this form of coal exports, which is to say that he is interested, whether he realizes it or not, in our foreign export commerce in every phase.

The Foreign Trade Committee of the National Coal Association has a large task on its hands, for it has not only to promote export commerce by seeking to make the way more auspicious for those who are

engaged in it by such means as are available to an organization of strength and prestige but it must as well convince the rank and file in the trade that it is on a worthy and worthwhile mission. Not only must the influence of the national organization be used to make the way less difficult for the exporter but the non-exporting coal producer must be helped to a fuller realization of the problems that beset our foreign trade in all its aspects.

Responsibility for Uncertainty

IT IS generally hoped and expected that the hearing on general freight rate reductions that will be initiated before the Interstate Commerce Commission on Dec. 14 will be made the occasion for a statement by the railroad executives of their position on coal rates. The country over, the air is surcharged with expectations of early decreases in the freight rates on coal, in answer to which the roads have made no official statement, although they are known to hold the opinion that they can and will volunteer no such reductions until railway wages fall. It has been unofficially reported that in answer to the petition of the iron furnace interests on the Lake front for reductions in coal, coke and limestone rates sufficient to equalize the reductions in iron ore for the Pittsburgh district, the executive committee of the American Railway Association passed a resolution two weeks ago to the effect that the rates on coal coke and fluxing materials would not be reduced, the prompt announcement of which decision would have done much to satisfy the situation.

Something more than silence on this question is demanded from the railroads. Too much has been left to inference. The imminence of reductions in freight rates on coal has hung over the market for months. It has not prevented buying for current requirements and has not deterred some stocking and so far cannot, therefore, be held to have seriously injured the business. But between now and the end of March, 1922, the country must take on large supplies as insurance against a mine strike in April and succeeding months, a strike of which there is as yet no certainty and some possibility of avoiding, but a strike for which old-time observers are looking as they do the eventuality of New Year's and the Fourth of July.

So long as there is the chance of saving 50c. or more per ton on freight by waiting just a little while, many buyers are going to delay taking on the storage they know they will require. For even a minority to enter a period of prolonged cessation of coal mining without ample supplies of coal would be serious. Responsibility for taking the uncertainty out of the minds of the buyers of coal rests with the railroad officials, even before the Interstate Commerce Commission. At the first opportunity in the hearing which starts next week the country should be informed how long it must wait for a reduction in the rates on coal.

Not Another Cocked Hat Incident

AS A RESULT of the efforts of the National Coal Association to have the weekly report of the Geological Survey on coal and coke transferred to the Department of Commerce there has been much speculation as to the ultimate fate of this valuable instrument and of the purpose of the coal operators in making the request on the President for the transfer of the work in the form in which they presented it. It will be recalled that some months ago the director of the Survey advised the association that the appropriation under which this report is being compiled and published was so nearly exhausted that he would be forced soon to curtail the work. The operators were informed that the compilation of the percentages of time worked and lost by causes, as represented in Table V of the weekly report, is the largest single item in the cost and that it would be necessary to discontinue it at an early date. It is doubtless because the data on which this table is based come entirely from the operators and their local associations that this message was conveyed to them in order that they, the parties most largely at interest, might make such provision as possible for its continuance.

It should be clearly understood that no other part of the weekly report is or has been at stake. The statistics of total production of bituminous coal, anthracite and coke—the most valuable feature of the report—is based entirely on figures furnished by the railroads. The published data on distribution, shipments through New England gateways, tidewater and Lake dumpings and distribution also come from the railroads and sources other than the operators. The weekly report of the Geological Survey as now issued is a development through several years of sources of information, a study of the needs of the industries and the country for that type of report and of a friendly liaison between the members of the Survey and those operators, railroads, consumers and others who supply the facts. That part of the finished reports contributed by the operators is small compared with the cost of putting their figures in shape for publication. It is this part that Director Smith has indicated he finds it necessary to forgo because of lack of funds. The remainder, we have every reason to believe, he has every intention of continuing.

In view of these facts there has been some surprise that the board of directors of the National Coal Association should ask the President of the United States for an executive order transferring not only the part of the weekly report to which they contribute and which is in jeopardy but the remainder as well to another department of the government. To rescue this important portion from the prospective scrap heap required and requires no order from the President. The weekly report was not inaugurated by executive order nor has it been specifically mentioned in the appropriation bills by the Congress.

If the Department of the Interior should find it necessary to curtail the report and the Department of Commerce is willing to assume the work, there is nothing in official red tape in Washington to interfere. This situation is quite generally appreciated, which makes it the more difficult to understand why the government relations committee of the National Coal Association should have gone out of its way to raise the issue of the transfer of this activity from the one department to the other, an issue raised in the Freling-

huysen bill and repudiated and repulsed by the same coal operators.

We are unwilling to give credence to the opinion held by some that the resolution to the President was prompted by a dissatisfaction with the work on the report in Mr. Fall's department and a desire to have it done by Mr. Hoover's. Such is not the temper of the men in the coal industry. It should be understood that the money that is available in the Department of Commerce is not in that bureau in which are found Mr. Morris and Mr. Wadleigh, devoted to foreign and domestic commerce in coal, but rather in the Census Bureau.

If the work be transferred it will fall to clerks trained in getting out reports at ten- and five-year intervals, and with no technical, sympathetic or understanding supervision such as furnished by the Geological Survey or possible in the Bureau of Foreign and Domestic Commerce. As for the transfer of surplus money now available from the Census Bureau to the Commerce Bureau, we can but suggest that the opportunity for and possibility of such is comparable to a transfer to the Survey of money that might be available in some other bureau of the Interior Department, as the General Land Office or the Reclamation Service.

Nevertheless, if Mr. Hoover will have the Census Bureau, which is temporarily in funds, undertake the clerical work of getting out the weekly reports on percentages of time worked and time lost because of car shortage, no market, etc., the continuity of a valuable record will be preserved until such time as the Geological Survey be furnished sufficient appropriation to do the work. To arrange this calls for nothing more than an informal conversation over the telephone between two men in Washington. The larger question of whether the statistical work on coal and coke developed by the Survey belongs there or somewhere else is a matter being considered by the Commission on Reorganization of Executive Departments of the Federal Government, a report from which is expected early next year.

WITH A TONNAGE PRACTICALLY EQUAL to 1920, the Lake season of 1921 has closed with no such furor or hetic finish as last year. In round numbers, 23,000,000 net tons of bituminous coal—cargo and bunker—were loaded at lower Lake Erie ports this year, which is much less than the more than 29,000,000 tons in the record year of 1918 but, compared with 22,750,000 tons in 1919 and 23,667,000 tons in 1920, is a noteworthy showing in view of the general depression in business.

The really significant thing about the figures this year, however, is not the total dumped but the quantity taken in at the Lake Superior American docks. From such data as are available now it is evident that the commercial docks on Lake Superior have taken as much coal this year as in 1918, when the total movement was some 3,000,000 tons greater than this year. In 1918 American docks on the upper lake received 12,727,000 tons, of which about 6,000,000 tons went to Ashland, Marquette and the copper range. The copper and iron mining industries have taken little coal this year, the railroads less than in 1918 and the iron and steel interests much less. The movement to American docks, commercial and industrial, this year has fallen little short of 10,000,000 tons. Plainly the Northwest is not only fortified for winter but well prepared against a shortage in the event of a strike next spring.

Plunger of Low-Temperature Carbonizing Retort Expels Product as a Bar, a Knife Slicing Off Briquets*

Process in Which No After-Treatment Is Provided—Raffloer Experimenting with Thirty-Five Foot Retort with Interior Convergent Flutings and Compressing Roller, Coal Being Carbonized in Two-Inch Layer

BY A. THAU†
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CONSIDERING that experiments in low-temperature carbonization have now consumed a period of twenty years, it may be thought surprising that this process has had so little development. Upon the other hand, the time that has elapsed indicates that extraordinary difficulties had to be surmounted. Those intimately acquainted with the circumstances know that the progress of the art has been delayed by the difficulties encountered in converting the residue into a marketable fuel. Upon this the economic value of the process hinges. Many, if not most, of the plants suggested and designed lack this essential property. A good example of this difficulty is that presented by the Coalite process in England, which, after twenty years of experimentation, part of which was on an extremely large scale, has only in recent years achieved satisfactory results and this only with newly-designed stationary retorts. A plant of this type and of commercial size has been erected at Barnsley, in Yorkshire.

CARBOCOAL, A TWO-STAGE PROCESS

Another conspicuous example is the American Carbocoal process, which, after a comparatively few years of intense and well-directed experimentation at Irvington, N. J., reached the desired goal. What probably is the largest low-temperature carbonization plant in the world employing this process has been erected at South Clinchfield, in Virginia. Though for the Coalite process a good quality of coal is essential, the Carbocoal process is practically independent of the quality of fuel used as long as it contains sufficient gas to insure a closed circuit for operating the plant. In this latter process the semi-coke is pulverized, mixed with pitch and pressed into briquets, which are again carbonized, leaving a marketable fuel of homogeneous texture and high quality.

An ideal low-temperature carbonizing process would, of course, be one in which a marketable fuel of definite shape was obtained in a single operation. This also should insure the highest yield of byproducts, though the word byproducts is hardly justifiable in this connection. The use of a revolving retort would be highly desirable in a plant of this kind.

Though the suggestion of Fischer, mentioned in the preceding article, that a loose roller be placed inside the revolving retort to assure compression of the fuel while coking, could not, for obvious reasons, be adopted in a plant working on a large commercial scale, Raffloer has followed up this idea and brought out a plant of rather remarkable design. This combines the advantages of a revolving retort with con-

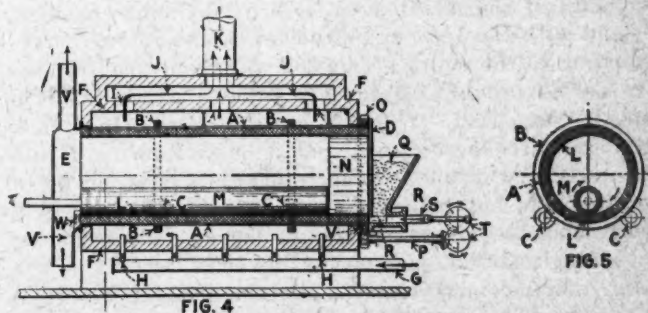
tinuous operation and compression of the fuel, obtaining thereby a residue of definite shape and of dense, marketable quality.

The retort is shown diagrammatically in the accompanying illustration, both in longitudinal and vertical cross section. It consists of a steel cylinder, A, provided with two annular rings, B, which rest upon rollers, C. At the charging end the retort closes, gas-tight, against the stationary end plate, D, which is of heavy cast iron. On the opposite end it fits in a similar manner against the face of the stationary chamber, E, which is open on the side toward the retort. The whole device is placed in an oven, F, built of firebrick, forming an annular heating space equidistant from the retort all the way round.

Underneath this oven, the heating-gas main, G, is suspended. This is provided at equal intervals with a number of vertical bunsen burners the ends of which pass through holes provided in the bottom of the brickwork, F, so that the burning gas plays upon the shell of the retort. In the top of the annular oven, F, passages, I, are arranged for the escape of the waste gases. In practice these are covered with sliding dampers for regulating the combustion. Above the oven, F, the connecting flue, J is installed. This is connected by means of a damper to a chimney flue or direct to the steel chimney, K.

On the inside the retort is provided with ribs which divide the inner surface into a number of longitudinal cells, L; these are slightly tapered, being narrower at the discharge end of the retort. Near the bottom of the retort rests a heavy cast-iron roller, M, guided by a protruding shaft running in a bearing in the end plate of the discharge chamber, E. The roller, M, is grooved lengthwise, its grooves corresponding to the projecting ribs of the retort shell, so that the space between the grooves momentarily underneath the roll covers the lowest cell, L.

Because the grooves of the roller, M, grip or mesh



PLANT WHICH DISTILLS COAL AND MAKES BRIQUETS

The fine coal entering the cylinder falls into the cellular receptacles, L, and is compressed by the grooved roller, M, as the cylinder is revolved. Forced by the action of a ram, a mass of semi-coke is thrust out at W, where it is cut off by a knife so as to form a small brick of semi-coke.

*A sequel to A. Thau's article entitled "Devices for Speeding Low Temperature Carbonization and Procuring a Dense and Non-Frangible Product," which appeared Dec. 1.

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with the ribs of the cells, *L*, the roller revolves automatically with the retort and does not require a separate drive. Furthermore, the lowest cell, *L*, is always tightly covered. The roller does not reach entirely to the charging end of the retort, the distance not covered by it being taken up by the broad annular sleeve, *N*, covering the cells all around throughout its length, so that the fuel occupying the cells cannot fall out. Near the end wall, *D*, on the charging end, the retort carries a toothed driving ring, *O*, which meshes with the small pinion wheel of the driving shaft, *P*.

FEEDS COAL INTO EACH CELL SEPARATELY

The casting forming the retort wall on this end is provided with a hopper, *Q*, taking the form of a steeply-tapered funnel. In the bottom of the end wall, *D*, a charging hole is provided, the cross-sectional area of which is proportionate to that of a cell, *L*. Outward, in line with the lower cell and the charging opening, the funnel, *Q*, forms a horizontal branch, *R*, in which a plunger, *S*, is moved by means of a connecting rod actuated by the common drive, *T*, which revolves the retort and operates the plunger. The stationary chamber, *E*, on the discharge end of the retort bears upon its top the pipe connection, *U*, that removes the gases evolved by the distillation of the fuel. At the bottom the chamber, *E*, forms a branch, *V*, through which the coke briquets are discharged. In operation this is designed like that shown in Fig. 2 of the preceding article, so that no gas can escape with the discharged fuel nor can air be drawn in at this point. The branch can also extend horizontally and be provided with a water-spraying device for cooling the briquets as they are being discharged.

The method of operating this retort is easily understood. The drive is so arranged that the retort is stationary while the plunger travels forward or inward and revolves only when the plunger has been withdrawn. A certain quantity of fuel which must be in a finely divided state falls to the bottom of the funnel, *Q*, filling the space behind the plunger, *S*. As soon as the retort comes to a stop, a cell, *L*, is in line with the plunger, *S*, and is covered by the roller, *M*. As force is necessary to move the fuel forward throughout the entire length of the tapered cell under the stroke of the plunger, the coal is compressed into a dense briquet of bar shape, of length proportional to the length of the retort.

CUT OFF LIKE CLAY BRICK BUT WITH A KNIFE

With each stroke of the plunger the fuel in the lower briquet bar is moved forward toward the discharge end of the retort, from which it protrudes a certain distance, corresponding to the stroke of the plunger. At the lowest point of the retort a knife is fixed in the chamber, *E*, and with the further movement of the retort, corresponding to the width of the cell, *L*, the protruding bar of fuel is brought against this knife and a definite length sheared off. The briquet thus formed then falls into the discharge pit, *V*, and is moved forward into the quenching channel. The retort thus does not move continuously but makes a short stop from cell to cell, permitting the plunger partly to charge and discharge, by a single stroke, each successive cell.

As the fuel must travel a certain distance before it becomes sufficiently heated to insure its amalgamation, the annular sleeve cover, *N*, is inserted to prevent it from falling out of the cells. During the charging and discharging operation, the lower cell in each case is

completely closed on three sides, and is only open at its discharge end, allowing the coke to be pressed out.

Raffloer's retort, which as yet is in only the experimental state, will have a length of about 35 ft. and a diameter of from 80 to 100 in. Such a retort, 35 ft. long and 80 in. in diameter, has a heating surface of approximately 1,076 sq. ft. and with a layer of fuel 2 in. thick holds approximately 106 cu. ft. of coal, which in the compressed state has a specific gravity of from 0.8 to unity.

Allowing one hour for the coal to pass through a cell, the capacity of the retort would be equal to about fifty tons per day. The heating of such a retort is so regulated that the heat is lowest on the charging end and gradually increases toward the discharge, so that the coal is gently penetrated by the heat on its way through the machine. An average temperature of 842 deg. F. is maintained.

The advantages inherent to this ingenious process are too obvious to demand special comment. It should be mentioned, however, that this is the first design of a revolving retort yielding, without after-treatment, a marketable fuel of dense structure and definite size and shape. The tar oil obtained from fuel treated in this retort is lower in free carbon than that from any other low-temperature carbonizing device, as the gas is withdrawn from an atmosphere that is entirely free from coal dust or other fine particles, the fuel being firmly held between the ribs forming the cells.

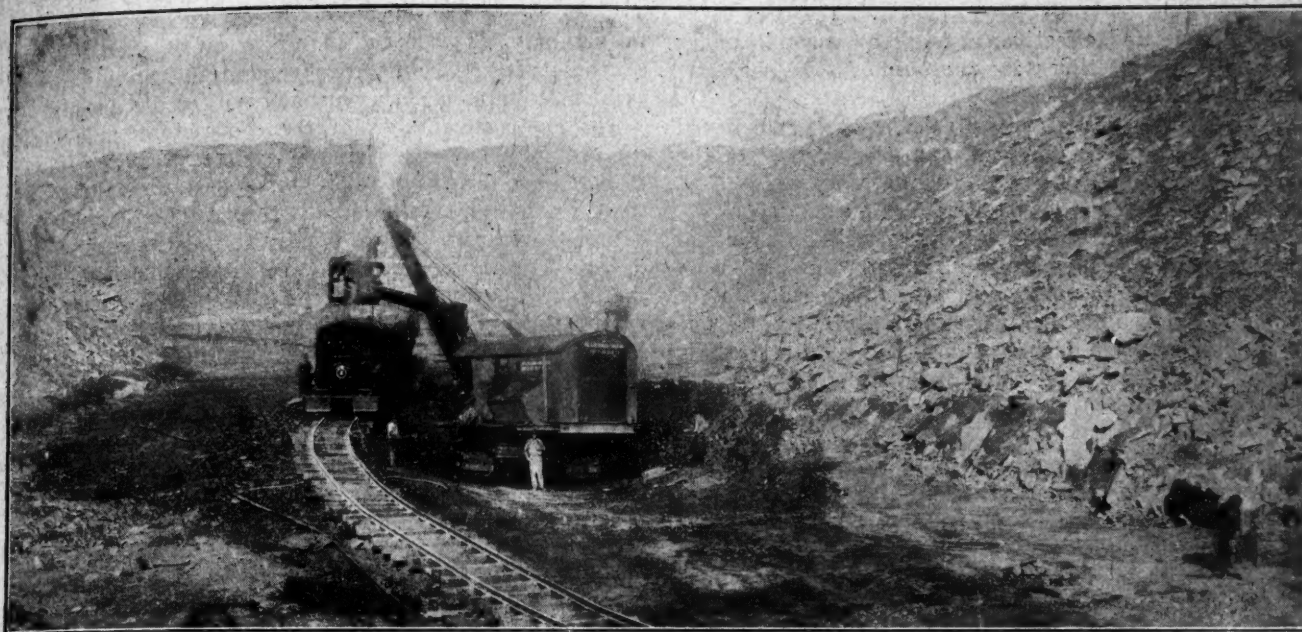
LENGTHENING LIFE OF CARBONIZING RETORT

As was mentioned earlier, cast iron and steel as used in low-temperature carbonizing retorts will not withstand heat continuously applied for any length of time, even though the actual temperature be comparatively low. The revolving retort is invariably made of steel plate, as the weight of cast iron prohibits its application in the shell of such devices. The effect of the heat upon the shell, however, is much less noticeable in a revolving retort than in a stationary one. This probably is because the gas flames do not impinge continuously upon the same spot as they do in the case of fixed retorts. Furthermore, in revolving retorts, where the same area is exposed to the direct influence of the gas flames for only a comparatively short time, the heat can distribute itself better and more evenly throughout the whole material.

Although the revolving retort is thus to a much less degree subject to the detrimental effects of the heat, a slow corrosion must, nevertheless, in time be reckoned with, and efforts to counteract it, as far as possible, are already being made.

In the American retort invented by Thomas, and shown on page 874 of last week's issue, the shell is provided with a double lining of firebrick, and the combustion flues are arranged between the linings so that the iron shell simply serves as a mantle and protecting cover and does not come in contact with the direct heat at all.

Another suggestion having the same end in view is under trial by American engineers. The attempt is being made to prolong the life of directly-heated steel shells of coking retorts by covering or coating their outside surfaces with a layer of aluminum. The results obtained are said to be highly promising, and the aluminum has proved to be a satisfactory protection against the scaling and porosity which the heating gases would otherwise cause.



COAL-LOADING SHOVEL AT BLANCHARD NO. 1 MINE, WYANO, PA.*

Stripping and Selling Coal on a Dead Market—II

Wire Brooms Deprecated—Contractors' Side-Dump Car with Side Boards Advocated—Sixty-Pound Rail and Three-Foot Gage Preferred—Strip-Pit Coal Not a Mixed Fuel—Action of Coal in Use Should Be Observed

BY WILLIAM G. BLANCHARD†
Pittsburgh, Pa.

THE stripping shovel employed at Blanchard No. 1 mine uncovers a cut of coal that may be as much as 110 ft. wide but which usually averages about 75 ft. in width. A 6-in. band of draw slate lies immediately on top of the main bed. The roof coal directly above this, which varies in thickness from zero up to 3 ft., being broken up by many partings, generally is so dirty as to be unmerchantable. As a result attempts are rarely made to recover any part of it, and the stripping shovel removes it with the roof slate.

In digging, this roof slate appears as an easily distinguishable white indicator, in contrast with the coal above and below it. A skilled operator, by exercising care, can uncover the main bed uniformly and with remarkable accuracy, neither digging into the coal nor leaving any appreciable amount of draw slate to be cleaned up by hand.

With a wide band of uncovered coal ahead of the loading shovel lying out in broad daylight and plainly visible to the watchful eye at all times, the coal can always be picked up and loaded into cars as a clean, merchantable product. Careful and intelligent supervision at this point will insure a coal as free from foreign matter as would be possible were it loaded from an underground working.

*The shovel is digging in preparatory to loading coal already stripped. It will proceed toward the foreground, which, it may be noted, is scraped ready for loading. The track is in the middle of the cut, which is its first position. After the coal has been taken out on this, the inner side, the track will be shifted toward the bank and the coal on the other side removed. The man on the right with the square-edged shovel is cleaning off the top of the coal. The course of the stripping shovel is so curved around the contour of the coal area that the end of the stripping appears to be visible, but, of course, that is not so.

†General manager, Blanchard Coal Co.

Study of the bed of coal under discussion will give the reader a better insight into the conditions which must be met in operation. The thickness of the coal ordinarily varies from 90 to 100 in. It is quite free from bands and slate partings with the exception of the two well-known Pittsburgh bearing-in bands which occur just below the middle of the bed and are separated from each other by only a few inches. In this locality one of the bands generally averages about $\frac{1}{2}$ in. in thickness and the other less than $\frac{1}{2}$ in., the whole representing on an average less than 0.75 per cent. of the entire height of the coal.

After the big shovel has stripped a section of coal the top needs no further cleaning except immediately in front of the coal shovel. Here the surface is scraped with ordinary square-pointed coal shovels. With reasonable care the top of the coal can be thus cleaned so thoroughly that practically no dirt is visible. Suppose, for the sake of argument, that $\frac{1}{2}$ in. of extraneous solid matter still remains over the entire surface of the scraped coal, although not visible to the naked eye. Even with such negligent preparation this impurity will compose less than 0.16 per cent of the total bed height. The figure normally attained probably is about 0.05 per cent.

The operator of the loading shovel should exercise great care so as not to dig into the bottom, under the coal. A good practice is to have the loading shovel leave about 1 in. of bottom coal in the pit. This is afterward lifted by hand, and as it breaks cleanly from the fire clay beneath, less than 0.25 per cent of ash-producing material is loaded from the bottom. This prac-

tice is simple and effective, and as the work is under supervision at all times its thoroughness is perfectly controllable.

From experience and careful calculation it is believed that the coal shovel loads less than one per cent of the foreign matter, including the bearing-in bands, and of this, much is removed on the picking table.

Consideration of these figures as well as practical experience have demonstrated that the use of such preparation equipment as mechanically-operated wire brooms or hydraulic machinery for cleaning the top of the coal is of no particular value, being only needless expense. Excellent results may be obtained by adhering to two simple rules: Scrape the top clean and keep up off the bottom.

For removing coal from a stripping operation no other conveyance on the market is so suitable as is the ordinary contractors' side-dump car. To use specially-constructed cars, those with either drop or gabled bottoms, or those of all-steel construction usually is

unfortunate. At the end of a year or so, even if some of these specially-built cars remain in running order (which is doubtful), they usually will be discarded.

The chief advantages of the contractors' side-dump car are ruggedness and simplicity in operation. It will stand severe usage with little or no cost for upkeep and the doors will open and close with equal facility regardless of the season. As an illustration of the ruggedness of this car an instance may be cited where seven of these cars dropped off the end of the tippie shown in Fig. 1 through a distance of 54 ft., each loaded with six tons of coal. The fall was a sheer drop to the railroad tracks below, and yet the cars had only to be put back on the track and a few splintered planks replaced to restore them to service.

Even this type of car, however, is not all that could be desired for the movement of coal because it is comparatively heavy for such a relatively light material. Furthermore, the center of gravity of the car is so high, especially when side boards are used, that good hauling speed can be maintained only over the best of tracks. A careful check usually will disclose the fact that the haulage of the coal from the shovel to the tippie, including the laying and maintenance of the coal track in the pit, represents an appreciable expense, and seeing that it is advisable to haul the maximum load possible on each car, side boards should always be used.

At this plant trips consist of seven 5-cu.yd. Western cars with 12-in. side boards. Thus the trip has a capacity of about fifty tons. Without the boards the largest capacity attainable ranges between thirty and thirty-five tons. This smaller capacity would necessitate at least a 50 per cent increase in the number of daily trips to the tippie, if the same output was to be attained.

TRACK AMPLY STRONG BUT READILY MOVABLE

Sixty-pound rails have been found to be most advantageous for the coal track in the pit. The strength and rigidity of this size of rail allow the use of the minimum number of ties, yet it is not too heavy for the track gang to handle. It usually will be found that with a lighter rail so many additional ties will be required to prevent it from bending on the ungraded coal surface that the seeming advantage gained by its light weight will be lost. Furthermore, the lighter rail does not afford as much sanding area as does the heavier one. Rails weighing more than 60 lb. per yard are too heavy and cumbersome to handle effectively in the pit.

On the main lines leading from the pit to the tippie certainly not less than 60-lb. rail should be employed, and it usually will be found that for light rolling stock this weight makes an excellent track and insures rapid haulage. The chief factor in the maintenance of this main-line track is drainage. The importance of this item should never be overlooked and the line always should be deeply ditched on both sides with culverts provided to discharge the water to the outside of the hill at regular intervals. Neglect of this precaution means constant care, a poor track, slow haulage and numerous wrecks.

A 36-in. gage is used, as wider track widths do not work out to advantage. With greater distance between rails longer ties must be used, making the track much more unwieldy and more difficult to put down, take up or throw over.

At this operation an arrangement was made whereby the stripped coal could be screened and loaded from a

BLANCHARD COAL CO.

COST SHEET

Blanchard No. 1 Mine

Year, 1921

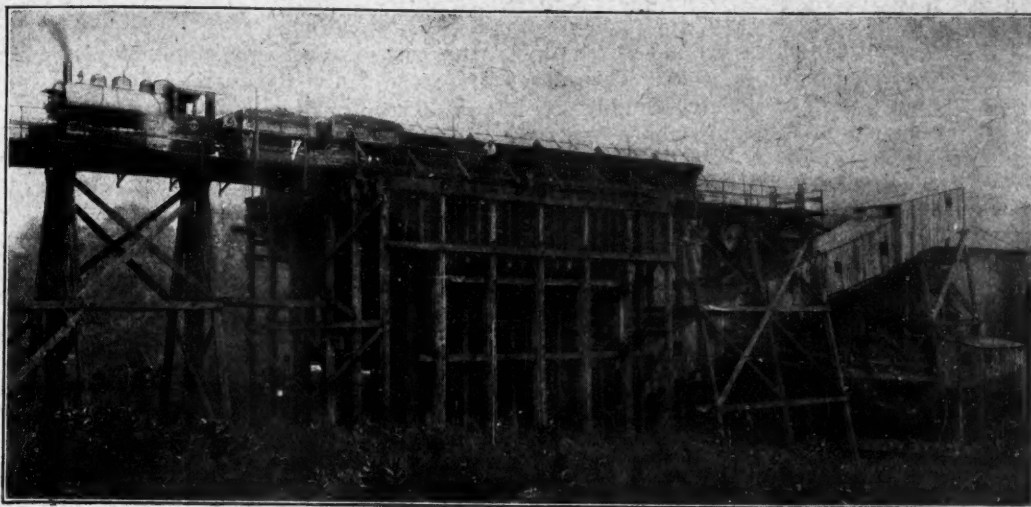
	Operating Expense	Month*	Total
1 Car rating.			
2 Tonnage.			
3 Payroll			
4 Other labor			
5 Oils and greases			
6 Gasoline			
7 Sand			
8 Explosives			
9 Miscellaneous supplies			
10 Repair parts and spares			
11 Freight and express inbound			
12 Telephone			
13 Light			
14 Power			
15 Office supplies and expense			
16 Boarding house supplies less payroll deductions			
17 Stable feed and supplies			
18 Extra teaming			
19 Farm			
20 Miscellaneous expense			
21			
22			
23 Total operating expense			
24 Total operating expense per ton			
	Office Expense		
25 Office salaries			
26 Rent			
27 Telephone and telegraph			
28 Stationery and supplies			
29 Miscellaneous office expense			
30			
31			
32			
33 Office overhead			
34 Office overhead, per ton			
	General Overhead		
35 Officers' salaries			
36 Fees			
37 Taxes (no excess profit or income)			
38 Insurance			
39 Interest and discount			
40 Auto operation			
41 Traveling			
42 Miscellaneous expense			
43 Mortgage interest			
44			
45			
46 General overhead			
47 General overhead, per ton			
48 Depletion at . . . c. per ton			
49 Depreciation at . . . c. per ton			
50 Total cost			
51 Total cost per ton			
	Sales		
52 Gross sales realization			
53 Gross sales realization, per ton			
54 Commissions and rentals			
55 Freight and price allowances			
56 Net sales realization			
57 Net sales realization, per ton			
58 Net profit			
59 Net profit, per ton			

*In the original cost sheet provision is made for each of the twelve months.

FIG. 1

Tipple, Approach and Storage Bin

The lessor of the tipple believed that the trips would rack, and the falling coal would strain, that building, so the approach and tipple were kept separate. The inclined shed on the right houses the conveyor which raises the coal to the screens in the tipple and serves also as a picking table.



tipple already erected and adjacent to the property. This tipple has three loading tracks beneath it, so that 1½-in. lump, ¾-in. lump, mine-run, nut, nut-and-slack, slack, or straight ¾-in. slack can be made.

The approach to this tipple presented quite a problem. A rule was made prohibiting all tying of the approach to the existing structure, as it was feared that such a procedure would cause vibrations to be transferred from the approach to the tipple. Fig. 3 shows the layout finally effected. It has been operating satisfactorily. All bents were set up on sound, substantial mud sills without the use of any concrete whatever. During the two years in which the structure has been standing not a single bent has had to be elevated or realigned.

Coal trains dump into the center of a 500-ton storage bin which is lined with sheet steel and has a discharge opening measuring 36 x 42 in. From the bin the coal proceeds over a reciprocating plate feeder onto a 4-ft. rubber belt that serves both as a picking table and as an elevating conveyor. By this it is delivered to chutes, discharging either to the screen or to a single-roll crusher below. One 15-hp. motor operates the belt and feeder, giving a capacity of more than 200 tons per hour. The coal is picked as it passes along the belt and highly satisfactory results are attained by this practice. Small screens in the plate feeder discharge

the coal to the belt with the slack underneath, and, as the belt is wide and flat and has a uniform slow travel, the moving coal can be watched without unduly tiring the eye. What little slate is present travels with the lump and can be easily seen and removed.

The single-roll crusher with all the conveying machinery was built of standard Jeffrey parts adapted to this particular layout and plans. During the process of loading, the railroad cars are spotted under the tipple by means of Fairmont car retarders. The control handles have been so arranged that from one point on the lower deck of the tipple the conveyor can be stopped and started, or any of the cars on the loading tracks can be dropped when necessary. With this layout it has been found that four men and two boys can thoroughly pick and load up to 2,000 tons in a 10-hour day.

Inspection of the cars while loading will show whether the picking is being done effectively. A written report on each car loaded is made, including the appearance of the coal, the thoroughness of the preparation and the fulness of the car. This last item is included because only railroad weights are used, and by this report the company is able to detect any loss from bad-order cars which may occur between the tipple and the weighing point.

Costs are analyzed by checking each item at the end

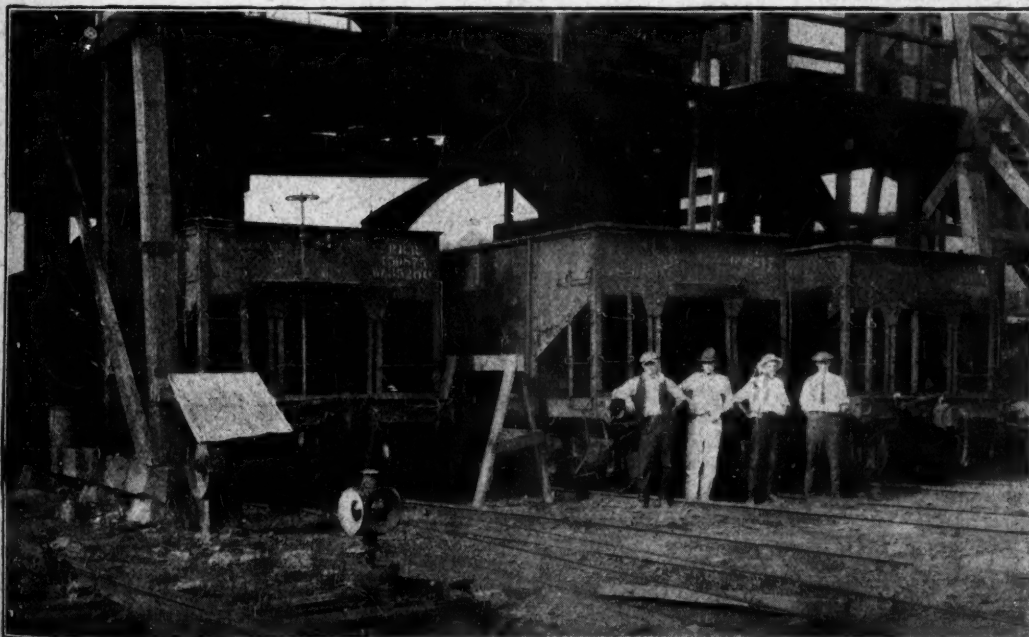


FIG. 2.

Under the Tipple

Three tracks under a single tipple span is a somewhat unusual arrangement. Note the retarder on the left which regulates the passage of the car under the tipple. From right to left the men are: W. G. Blanchard, general manager; C. M. Blanchard, mining engineer, formerly of Birmingham, Ala.; P. W. Rainier, superintendent, formerly in the gold dredgings of South Africa, and C. A. Snyder, shipper and chief clerk.



The size of this bin makes it necessary to place the trestle stringers more than 45 ft. above the top of the railroad rail, causing the approach trestle to be unusually high.

Take, for an example, the coal coming from the Blanchard No. 1 mine, under discussion. It is a high-grade Youghiogeny, or Westmoreland, gas coal in which the sulphur content will consistently average less than 1 per cent. The ash will vary somewhat but will run about 8 per cent. The heat-content of a pound

Three Hundred and Forty Ton Shovel

of the dry coal will range pretty consistently between 14,000 and 14,500 B.t.u. no matter whether the fuel is red-stained or black and shiny. The coal burns freely to a powdery ash without clinkering. It gives off its high gas yield freely and easily and furnishes its results in producers that are mechanically agitated. It makes an excellent byproduct coke of high porosity and firm structure, such as is required for blast-furnace operation. The amount and character of the sulphur content are such as to make the coal particularly suited for metallurgical heating, yet it serves excellently where boilers must be pushed to high overload capacity. In such a case, because of the low moisture content, the character of the ash, and the structure of the fuel itself, a ton of this coal under a boiler in many instances will evaporate more pounds of water than will a ton and a half of some so-called high grade steam coals.

Armed then with this knowledge, which has been gained through wide experience under the most rigid comparisons and tests, it is not particularly difficult for one to go out and market this coal intelligently and honestly, knowing that the product when fired will fully justify all that has been said of it.

Producer Gas, Deriving Little Sulphur from Coal, Makes Good Iron-Works Fuel

WITH the failing supply of natural gas many attempts have been made to find some suitable substitute fuel. Among those tried have been pulverized coal, water gas, crude oil, and gas from coke-ovens, blast-furnaces and producers. Though each of these seems to possess its own peculiar advantages, pulverized fuel, petroleum and producer gas appear to be particularly adapted to use in plants remote from coke ovens or blast furnaces.

"Clean cold producer gas from bituminous coal" was made the subject of a highly interesting and instructive paper presented by C. F. Kaufman before the Metropolitan Section of the American Society of Mechanical Engineers at Newark, N. J., Friday evening, Oct. 28, 1921. In this paper and the discussion that followed some details were brought out that may be significant to coal producers, particularly those of the West and Middle West.

EXTRACT TAR FROM GAS WITH SPUN GLASS MAT

Producer gas may be utilized either raw—that is, hot and containing all the tar given off from the coal—or cold with the tar extracted. Of these two the latter seems to be the more advantageous method. Extraction of the tar is fairly easy, the gas being first passed through a mat of spun-glass wool and then through an extractor not differing greatly in principle from the eliminator used in steam lines. Tar thus withdrawn from the coal is returned to the producer and sprayed over the top of the fuel bed. Here it is largely broken up or "cracked" into gas. Tar coming from the coal where reutilization of this kind is practiced is of a much more liquid character than when it is not returned to the producer.

Another, and for metallurgical work a highly important, consideration is the fact that only a small portion of the sulphur contained in the original coal is finally delivered with the gas. At one large plant using this fuel in the manufacture of high-grade alloy and tool steel 93 per cent of the sulphur in the coal is left

behind by the gas. The quantity of this element, therefore, that may be absorbed by the metal from the fuel used in the process of manufacture is comparatively small. This would render the gas from a fuel relatively high in sulphur quite suitable for ordinary purposes of metallurgy, such as steel making, steel forging and heat treatment.

DON'T ROAST ASH AT HIGH TEMPERATURE

The actual quantity of sulphur carried over with the gas depends upon many factors. The first of these is the form in which this substance occurs in the coal. If present as pyrite it is readily carried off in the ash, but the manipulation of the producer will strongly influence the percentage that will find its way into the gas. Thus continuous roasting of the ash at high temperature tends to drive sulphur over with the gas. Organic sulphur also is highly susceptible to expulsion in a gaseous state. The treatment of the cooling water also affects the quality of the gas. If part of this water runs to waste and makeup is introduced to take its place much sulphur is carried away with the rejected water. If the cooling water is continuously recirculated it soon becomes saturated and can, of course, remove no more sulphur from the gas.

MANY TYPES OF PLANTS USE PRODUCER GAS

Several well-known users have employed this fuel for years past. The Ford Motor Co., both at its Highland Park (Mich.) and Walkersville (Ont.) plants, does miscellaneous heat treating with producer gas made from Ohio and Kentucky coals. The A. O. Smith Co., of Milwaukee, Wis., for years did similar work, using Ohio coal. The Jeffrey Manufacturing Co., of Columbus, Ohio, does much heat treating and forging, using producer gas from many different coals, for this firm usually buys its fuel from its customers, and these, as everyone knows, are scattered over an extremely wide range of coal territory. The Dayton Engineering Laboratories Co. does heat treating and forging with producer gas made from either West Virginia or Kentucky coal. The Standard Horse Nail Co., of New Brighton, Pa., and the Reliance Manufacturing Co., of Massillon, Ohio, use Massillon coal in gas producers. The former uses producer gas on light forging work and in the making of horseshoe nails. The Reliance company uses the gas for heat treating steel in rotary furnaces.

HAVE NOT DRAWN FIRES FOR OVER THREE YEARS

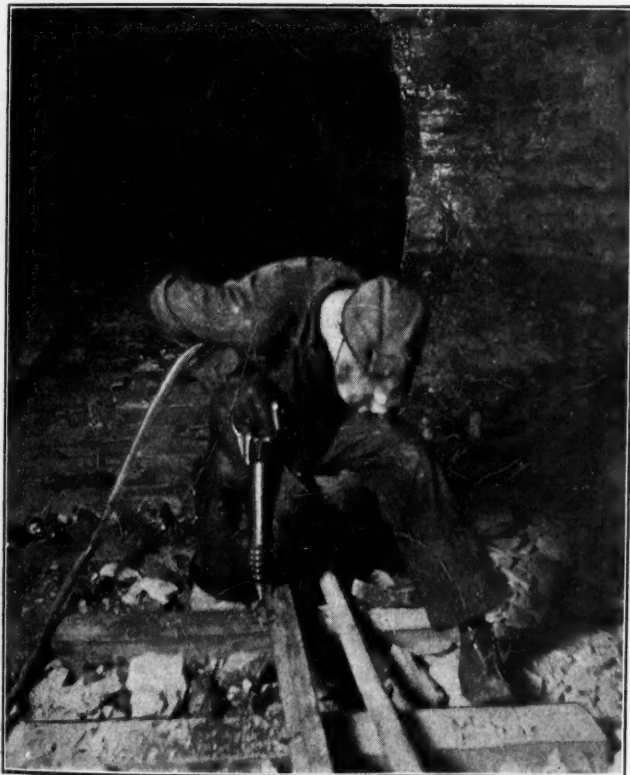
The uses to which producer gas can be and is even now being put are legion. Not only is it suited to metallurgy but also to power generation both in the internal-combustion engine and under the steam boiler. It also finds application in soldering, brazing, annealing, tempering, smithing and similar furnaces, in glass manufacture, in the making or cooking of cereal food products and the like. Producers as now made are quite reliable and one plant is now in operation the fires of which have not been drawn for more than three years. Because of its cleanliness, flexibility and ease of control it would appear that this fuel will find even wider application in the future than it has in the past.

CORRECTION.—On page 611 of our issue of Oct. 13, 1921, the statement was made that the Spencer heater was the "product of the Spencer Heater Co., of Scranton, Pa." For some months past this furnace has been manufactured by the Standard Heater Co., of Williamsport, Pa.

Light Air Hammer with Half-Inch Hose To Be Used in Place of Hand Pick

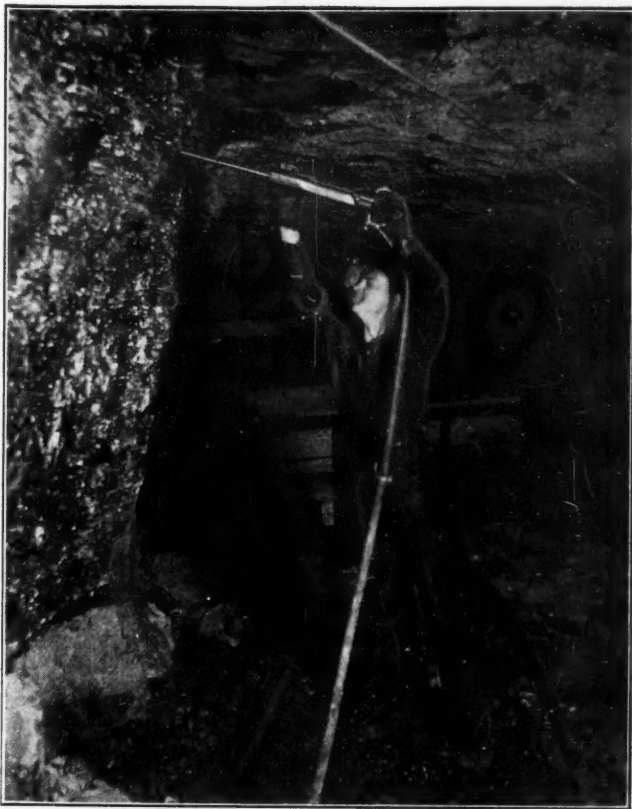
TO MEET the demand for a light, easily-handled air pick or drill a machine of that type weighing only 16 lb., having a length of 17 in. and requiring only a $\frac{1}{2}$ -in. air hose has recently been made. This machine was primarily developed to meet the demand of the coal mines of France and Belgium for a tool of this character which would take the place of the hand pick in mining the thin beds and working the narrow places of the many fields in those countries having limitations of that kind. It has proved successful and popular for the work for which it was designed, and its use has been extended accordingly from the coal fields of the European Continent to those of Great Britain and elsewhere. It is now offered in this country for any of the many purposes for which its light weight, the character of its blow and the type of cutting tools employed may seem to adapt it.

In coal mines the "pick hammer," as it is called, may be used to advantage as a substitute for the hand pick in doing any kind of work that a hand drill can perform, such as trimming walls, taking up bottom coal left by mining machines, brushing roof and cutting hitches in walls and rock. This hammer may be used also for cutting emplacements for timbers and the like. On construction work it may be employed for scaling down loose rock from the walls of excavations, demolishing brick walls and subsequently cleaning off the bricks, for chipping or smoothing off concrete surfaces, and for the light work of concrete removal, for loosening up the broken or disintegrated rock in foundations, and for many other similar tasks frequently encountered by the miner, contractor, builder or quarryman.



PICK HAMMER DRIVING SPIKE IN TIE

With much poetry of motion the hand sledge driver delivers his blows. He may plant them well but certainly not as rapidly as does an air hammer and the work is more wearisome to the hammerman. The slogan of today is "Let the tool do the work and it will be done." The adage proves even truer than that of Benjamin Franklin: "If you want anything done do it yourself."



CUTTING A HITCH IN THE COAL

The job could be more easily done by bringing up the empty from the rear and using it as a platform, but it can readily be accomplished as shown, for the hammer is light, and the pipe line is not heavy, so it is easy to cut the hitch with the tool held well above the head.

The pick hammer consists of a cylinder provided at the rear end with a D-handle and at the forward end with a spring tool retainer for holding the pick or other tool used. A hollow cylindrical or shell valve, actuated by differential pressure, regulates the admission of air. The hammer or piston reciprocates within the valve proper, thus providing a long stroke without excessive length of tool or undue weight. The drill is controlled by pressure on a trigger, which is placed in the grip of the handle, where its action will not be hindered by accumulations of chips or dirt.

This hammer strikes a hard, snappy blow, giving abundant power for the work for which it is intended. The machine will operate satisfactorily on any air pressure from 45 to 100 lb. per square inch. The tools are held in place, as stated above, by a steel spiral spring of special temper. This also dampens the blow when the hammer is running light. The result is that pick breakage, as well as damage to the tool itself, is small.

The lightness of the tool retainer prevents the machine from being nose heavy—that is, from having at the front end an undue weight that would tire the operator. The smoothness with which this tool operates and its freedom from vibration make it unusually easy to handle.

Two long cap screws by which the D-handle is secured keep the various parts in place. No screw joints are employed. All parts are either drop forgings or tool-steel bars, machined to proper dimensions and working clearances. They are made of special alloy of steel, carefully heat-treated by special processes so as to obtain maximum life and resistance to wear. All parts are interchangeable, and are subjected to rigid inspections and tests.

It is claimed for the pick hammer that it consumes

only a small quantity of air per unit of work accomplished and that its efficiency is maintained throughout a period of long service, that its smooth operation eliminates undue fatigue upon the operator and that repairs will be infrequently needed. Ordinarily the tool used in this hammer is the sharp pointed pick or gad. Other forms of working tools may be supplied or made up by the customer to suit his individual requirements and the work to be done. The diameter of the cylinder is $1\frac{1}{4}$ in. and the shank of the pick steel has a cross-section of $\frac{3}{4}$ x $2\frac{1}{4}$ in. The tool is made by the Sullivan Machinery Co., of Chicago, Ill.

Belt Conveyor by Sagging More Closely in Accord with Grade Lowers Building Costs

TWELVE miles south of Pittsburgh, Pa., on the Peters Creek branch of the Pennsylvania R.R., the Gould mine of the Bertha Coal Co. is operating a small acreage of the Pittsburgh bed. The mine output is shipped mainly to gas-producer plants and pottery manufacturers. The coal underlies two adjoining hills situated due east and west of each other. The west side has been in operation for about five years, whereas the east side is still under development. A wooden tippie with shaker screens stands at the foot of the hill at the western side of the valley. Coal from the old workings is lowered to the tippie by means of a self-acting or gravity plane. The output from this side has not been sufficient to keep the tippie running at anywhere near full capacity.

In order to increase the mine production the company decided to open the east side. Two advantages would be gained by this means. In the first place, the closer the daily output can be made to approach the tippie capacity the less will be the preparation and loading cost; second, as the acreages on both sides are small, mining should proceed as rapidly as possible. The coal area on the east side covers approximately 35 acres.

BELT CONVEYOR EASY TO INSTALL AND OPERATE

Upon investigating the new property the company found that the landing point from which the coal must be conveyed across the valley was approximately 224 ft. from the tippie. Furthermore it was at an elevation of 35 ft. or more above the mean valley level, or about 20 ft. above the discharge point on the tippie. The problem presented, then, was to provide an efficient means of conveying coal from the east side to the tippie at a cost that would be in keeping with the limited acreage available.

It was decided that the most feasible method of coal transportation would be by means of a belt conveyor. However, a straight line joining the dumping point on the east side with the tippie showed that a belt conveyor following such a line would require a trestle containing a number of high bents, involving an expense for building not warranted by the limited acreage.

In February, 1920, a conveyor was completed that effected marked savings in bent timbering. The trestle, or conveyor frame, was built with a curve or belly that materially decreased the bent heights required. The conveyor line follows a compound curve with slopes of from 12 to 18 deg., the smaller value being on the tippie approach. The bents were placed on 14 ft. centers, and their heights vary from a minimum of 10 ft. to a maximum of 19 ft. Had the conveyor been built on a straight

line, the greatest height of bent would have been approximately 35 ft. This would have required heavier timbers than those used in the modified construction.

As finally installed the bent construction essentially consists of 6 x 6 in. or 8 x 8 in. built-up legs resting upon two-way mudsills. These are tied together transversely by 2 x 6 and lengthwise by 2 x 8 in. pieces.

Five-pulley troughing belt idlers are used for carrying the load with a flat-pulley return on the under side. The 30-in. composition belt with its accessories was furnished by the Robins Conveying Belt Co. A 20-hp. Imperial direct-current motor drives the conveyor.

The daily output at present is about 800 tons, most of the coal coming from the old workings. Rooms have not yet been driven in the new mine, so that only heading coal is being produced there. For this reason the conveyor is being operated intermittently, quickly disposing of a trip when it is dumped. The capacity of the conveyor is estimated at 2,000 tons per eight-hour day.



BELT CONVEYOR AT GOULD MINE SEEN FROM TIPPIE

At first glance one would think the coal would roll down the grade, especially the last lumps in a train load. The grade is the maximum generally conceded for belt conveyors, being 18 per cent. Coal is discharged upon the belt conveyor by means of a shaker feeder. The foot walks on the sides are 3-in. plank placed upon the top of 2 \times 6-in. tied-in members.

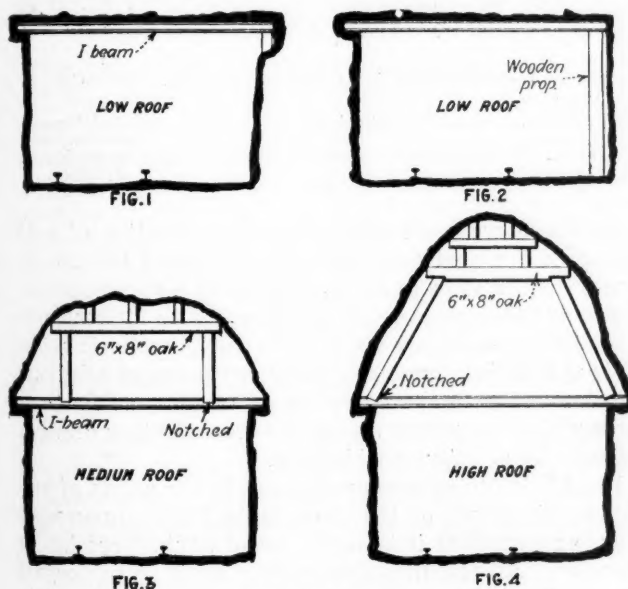
Methods of Supporting Roof of Roadways Adopted at the Indianola Mine

BY ALPHONSE F. BROSKY*
Pittsburgh, Pa.

THE coal mined at Indianola is the 7 ft. 6 in. Upper Freeport bed, which has a weak roof. Steel timbering is employed almost universally throughout the mine, except in the rooms. When depreciation and ultimate expenditure are considered, the operator as a general rule can well afford to install correctly designed steel sets, even though they may cost three or four times as much as wood sets of equal strength. Consequently this mine uses steel timbers, not because wood cannot be employed but rather on account of economy and safety.

Mouths of entryways are supported by steel I-beams of various weights, steel H-beams, and steel-timber sets supplemented by various forms of concrete construction. All haulageways and manways are carefully whitewashed. The extensive electric lighting which has been installed in this mine is no small item in increasing the efficiency of underground operations and certainly makes conditions not only safer but more pleasant.

In the main bottom on the north, or load, side of the shaft, 12-in. steel I-beams are used as collars. These are supported by 8-in. I-beam legs. The latter are connected to the collars by angle brackets and rest on small concrete footings. They are placed on 5-ft. centers. Fifty feet of timbering on each side of the shaft is capped with heavy wooden lagging, and the roof is well supported with heavy wood blocks and timbers. To prevent lateral thrust, the timber sets are made rigid by the use of heavy wooden separators between collars, and tied together by 1-in. steel rods. The legs, of course, are anchored to the concrete footings. The entry is double-tracked for 600 ft. from the shaft to the knuckle, and the span over the roadway consequently is rather long, the collars being approximately 18 ft.



FIGS. 1 TO 4. METHODS OF TIMBERING AT INDIANOLA MINE

Fig. 1—Steel I-beam or H-section used as a collar with one end on the lower surface of a hitch in the coal and the other on a short post inserted in another hitch. Fig. 2—Similar beam supported on lower side of hitch at one end and on a prop at the other. This method of support will be replaced by that in Fig. 1 with longer beams than are now used. Fig. 3—Timbering and steel beams for caved roof. Fig. 4—Steel beam, timber set and filling-in material where the roof has caved inordinately.

*Bituminous Editor, *Coal Age*.



FIG. 5. STEEL TIMBERING AT LANDING

Twelve-inch steel I-beams are used as collars and 8-in. I-beams as legs, and latter being connected to the collars by angle brackets. The legs rest on concrete footings and are spaced on 5-ft. centers. Many wood blocks are used above the collars and for 50 ft. from the shaft on either side the roof is heavily lagged.

in length. The same type of timbering is used on the south, or empty, side of the main bottom as is employed on the north.

All the turnouts from the main entry near the shaft are spanned by 24-in. I-beams, which act as supports for 12-in. longitudinal I-beam collars. These latter are connected to the larger beams by angle brackets and bolts. The larger transverse beams may rest either upon the coal, on pillars of brick or concrete, or on heavy wooden posts. To protect the salient angles of corners formed by main turnouts brick pilasters have been erected. This provision keeps turnout junctions clear. Otherwise the unprotected corners might be crushed.

From the knuckle northward, as the entry is single-tracked only, a different style of timbering is used. Steel I-beams or H-sections are utilized as collars, one end resting in a hitch in the coal while the other is carried on a short wooden sprag or leg, which also is supported on the rib, as shown in Fig. 1. All these beams are cut to a standard length. In many places the width of the entry is too great to permit both ends of the beam to rest on the ribs. In such cases one end is carried on the coal and the other on a wooden prop, as shown in Fig. 2. This type of support is used only to a limited extent and will be replaced later by that shown in Fig. 1, wherein longer beams are utilized. Where wooden props are employed, they not only obstruct an otherwise clear passage but are dangerous because they may be knocked out by a derailed car or trip or by a projecting load of rail or props.

At one place, a butt entry in the northeast section, the roof is very high and has begun to arch. Here another type of timbering is used. As shown in Figs. 3 and 4, it is a combination of steel and wood and might well be called a composite or Gothic set. A 12-in. I-beam rests on the coal of both ribs at the usual height of the roof. An ordinary three-piece wooden set is placed above and rests on this beam. The wooden timbering is 6 x 8-in. oak.

Where the roof extends only a few feet above the transverse steel beam the type of timbering shown in Fig. 3 is employed, and if the roof is six or more feet above the steel collar that shown in Fig. 4 is used. The legs of the wooden set are notched where they rest upon the I-beams so as to prevent their being readily dislodged. It has been found that black graphite paint is a better preservative for use upon steel timbering than is red-lead paint.

By Fusing Iron with Its Silicide a Metal Is Made Resisting Corrosion and Erosion

FOR many years mine managers have been seeking a metal that will resist corrosion and erosion. A metal has been found which has those qualities in a marked degree. It contains approximately 69 per cent silicide of iron (Fe_2Si) and 29 per cent of iron with small percentages of manganese, sulphur, carbon and phosphorus present as impurities. It is known as Duriron.

It was not developed for mine use but for handling chemicals and has so far had little use at coal mines. The Brazil Collieries Co. has been using a pump liner of this metal and has found that where a bronze lining would last two months and, indeed, even less, a Duriron liner gave excellent service for two years before it needed replacement. The old mine of this company had extremely corrosive water, the drippings from the slate of the roof being full of free acid. It was so bad that common black pipe lasted only two or three weeks in this class of service. Duriron pipe would have saved this loss, but, unfortunately for the industry, it was not tried.

It has been known for many years that an iron of high silicon content possesses remarkable properties of acid resistance, but extreme difficulties in commercial production limited its manufacture until a few years ago. About ten years ago an English firm attained excellent results with such a metal, known as Tantiron. This became widely used in Great Britain before the war and to some extent in the United States.

Naturally some Americans saw the possibilities in the manufacture of a similar alloy and their experiments resulted in the organization, in 1912, of the present Duriron Co., at Dayton, Ohio, for the manufacture of the metal Duriron. However, it was only after hundreds of experimental heats and mixtures that the preferable constitution for the product to be termed Duriron was attained. Tantiron at that time, it may be said, had a silicon content of about 11 per cent and nearly 2 per cent of manganese.

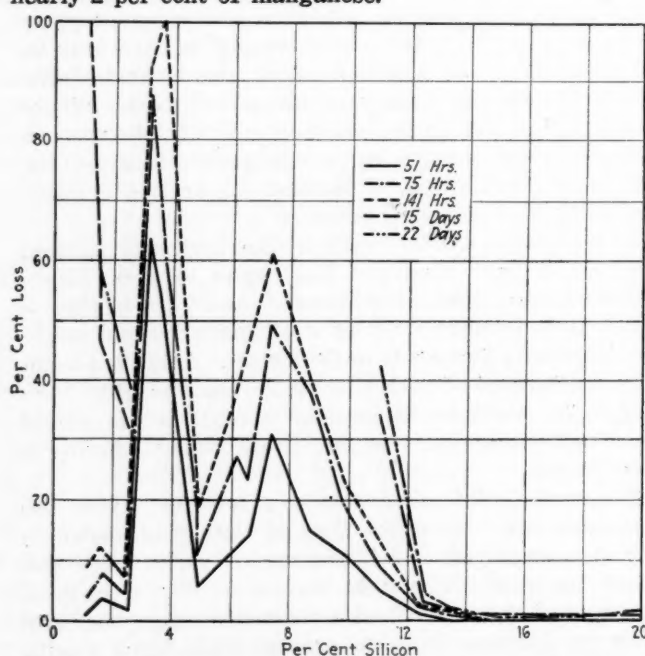


FIG. 1. GRAPH SHOWING ACTION OF 10 PER CENT SULPHURIC ACID ON IRON-SILICON ALLOYS

By rightly proportioning the silicon a metal highly resistant to the action of sulphuric acid is obtained. The graph shows clearly the value of high silicon.

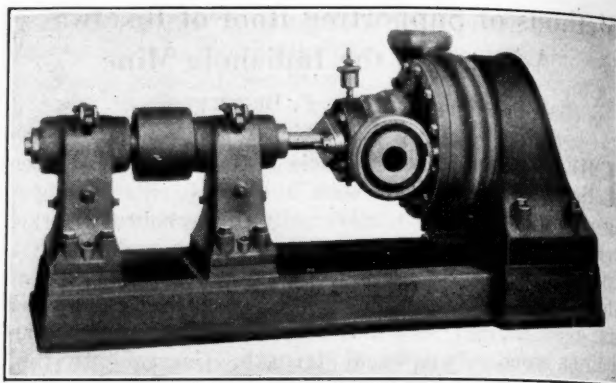


FIG. 2. MOTOR-DRIVEN DURIRON CENTRIFUGAL PUMP
The base is specially designed for direct connection to any type of motor. It runs at a speed of 1,760 r.p.m.

As most acids rapidly destroy iron and affect iron silicide only slightly, it may readily be seen that their action on equipment made of this silicide would be negligible and entirely uniform. This compound, however, is not commercially practicable because it is extremely hard and brittle. Any other metal added to soften or toughen it opens it again to attack by acids. To date the best combination seems to be the formula mentioned above.

Tests by the U. S. Bureau of Standards on Duriron are given in Table I. They show that the amount of corrosion caused by sulphuric, nitric, hydrochloric, acetic, phosphoric, oxalic, picric, oleic and pyrogallie acids and by aluminum potassium sulphate, copper sulphate, ammonium chloride, ferric chloride and bromine is alike relatively small, bromine and hydrochloric acid being least resisted. The test was made cold and lasted 120 days, but concentrations were used for the pickling of Duriron far stronger than are found in mine waters. The reader will note that in the case of sulphuric acid 95, 25 and 10 per cent of acid were used. Yet the loss was small. The temperature ranged from 59 deg. to 68 deg. F.

TABLE I—CORROSION OF DURIRON IN SULPHURIC ACID

Concentration of Acid by Weight, Per Cent	Per Cent Loss	Depth of Corrosion, Inches per Year
95	0.007	0.000206
25	0.016	0.000463
10	0.025	0.000685

As the corrosion increased as the quantity of acid decreased it would seem desirable to extend the experiments further so as to see at what point a reverse condition would take place, such as is found with hydrochloric acid and less certainly with nitric and phosphoric acids. As is well known, some extremely concentrated solutions are less active in the corrosion of certain metals than those which are not so strong, whereas further dilution reduces the activity considerably.

In addition to extreme resistance to the action of sulphuric acid shown by the above table, Duriron possesses such hardness that it is almost proof against erosion or abrasion. All machining operations must be performed by grinding with specially made abrasive wheels. The most difficult part of the production of such an alloy is not in obtaining the proper chemical combination to give resistance to corrosion, but lies in the development of foundry technique which will overcome the difficulties of producing the metal in standard commercial forms. The earlier years of American manufacture were devoted to gaining such knowledge, with the result that an ample supply of efficient apparatus for the manufacture

of explosives and lethal gases was available to meet the call of the government when the United States entered the war.

Besides the difficulty of manufacturing Duriron in commercial forms it has been a problem to evolve such standard designs as would meet the usual needs of manufacturers or users of corrosives. This, of course, allows production at lower price than if each problem were met by a special design and casting. Many difficulties which seemed at first to be insurmountable have been overcome and additional progress is constantly being made.

The ready adaptability of Duriron makes easy the procuring of special forms of apparatus, though great ingenuity in design often is required to overcome the handicaps imposed by the peculiarities of the metal, such as high coefficient of expansion, extreme hardness and lack of machining quality.

Fig. 1, taken from a paper read by O. L. Kowalka, appearing in the Transactions of the American Electro-Chemical Society, Vol. 31, 1917, pages 205 to 212, shows how the percentage of loss in 10 per cent sulphuric acid depends on the percentage of silicon in the iron. The minimum loss is sustained where the percentage lies between 14 and 15 per cent. Duriron used roughly the former percentage. Note how adding about 3.5 per cent of silicon gives poor results, 5 per cent much better, 7.5 per cent results not so good, the best results being where 14 per cent and over are used.

Duriron castings are made up to nine tons in weight. Single-stage centrifugal pumps with 2-in. and 3-in. suction are already being manufactured by the Duriron Co., Inc., of Findlay St., Dayton, Ohio. They are so constructed that the packing cannot be touched by the corrosive water, as the suction is always under vacuum while the pumps operate.

Anti-Friction Belt Bearings Save Power, Making Longer Belts Permissible

EVERYONE knows that rolling friction is vastly less than sliding friction and that ball and roller bearings consume only a fraction of the power that plain bearings require. Many modern machines would be well nigh impossible were it not for this fact. Perhaps the best known example of a machine of this kind is the automobile. Here both ball and roller bearings are used to carry the weight of the machine, and to reduce friction in various parts of the driving mechanism.

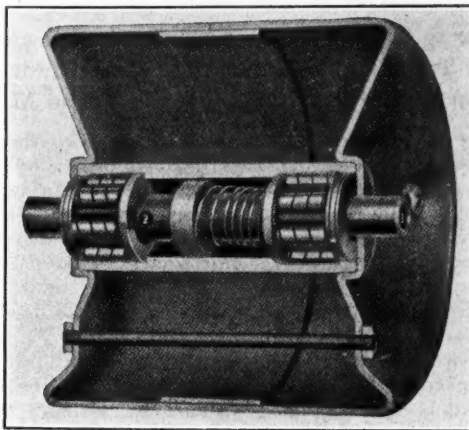
Substitution of anti-friction bearings for those of older and less efficient type may sometimes be profitably made in machines of a design whose usefulness has been long established. At least most mining men are familiar with the way in which the roller bearing has increased the efficiency and flexibility of even such a crude device as the ordinary mine car. As time goes on this type of bearing is being adapted to other kinds of equipment.

One of the latest of these adaptations is to the troughing idlers of belt conveyors. The Stearns Conveyor Co., of Cleveland, Ohio, uses either plain babbitt, Hyatt roller or ball bearings upon the idlers of its conveyors. The accompanying illustration shows one of these idler pulleys fitted with roller bearings.

This pulley is of somewhat unusual construction. It consists of two cold-drawn sheet-steel cups held together by three through bolts. The two cups are maintained in

exact alignment by an internal circular sheet or cylinder welded inside of one cup and projecting beyond its mouth. This telescopes into the mating cup, holding the two firmly in line.

Ball, roller or plain bearings are provided, turning on a hollow and, in the case of the roller bearings, a hardened and ground steel shaft. Encircling this shaft and lying within a sleeve extending between the two bearings is a helical steel spring. At one end this rests against a bearing while the other bears upon a cupped



ROLLER BEARING NOW APPLIED TO
BELT CONVEYOR EQUIPMENT

The grease gun is applied at 1 and the grease passes through the shaft and out at 2. Here it fills up the chamber around the shaft and, pushing back a sliding piston, enlarges the space to be occupied. A helical spring which resists this motion keeps the grease in continual compression.

washer fitting fairly close upon both sleeve and shaft yet free to move endwise within the one and upon the other. A hole is drilled from the outside to the interior of the shaft just beyond the position of the washer when the spring is relaxed.

It will be seen from the above description that grease under the action of a suitable gun may be forced into the space between the shaft, the sleeve, the bearing and the spring-actuated washer, thus forming a reserve supply capable of lasting under ordinary service for a year or more. These rollers should be greased, however, once every six months, thus making it absolutely certain that they will not run dry.

Tests conducted upon troughing idlers provided with ball or roller bearings of this type show some interesting results. It has been found in comparing roller with plain bearings—as stated above, this firm makes both—that the roller bearing requires only about one-half as much power to operate as does the one fitted with plain babbitt journals. This is an important consideration to bear in mind when selecting a conveyor belt.

Suppose, for instance, that an installation is to be made for moving coal horizontally over a distance such that if the conveyor is built in one section and the idlers are fitted with plain bearings the pull upon the belt would be destructive. In such a case a second section with its separate and independent drive would be necessary. With roller bearings, however, the entire distance could be covered with one section of conveyor, thus not only decreasing the cost of installation but entirely obviating the degradation resulting from the transference of the coal from one belt conveyor to another. Furthermore, with a short conveyor a lighter belt may be used or the same belt will give longer service.



Problems of Operating Men

Edited by James T. Beard



Wiring a Mine for Locomotive Haulage

Scheme to Reduce Amount of Equipment and Cost of Installation — Use 20-Ton Locomotive on 5 Per Cent Grade and Two 8-Ton Locomotives on Level Haul, in Place of Six 8-Ton Machines Over Entire Haul

MY attention was attracted to the very complete and well worked out answer to a question asked at the last Mine Inspectors' examination at Pittsburgh, Pa., *Coal Age*, Sept. 8, p. 384, relative to wiring a certain shaft mine for haulage and machines. We have since been analyzing this question and desire to submit the following scheme, which requires less equipment and is more economical.

While it is true that mine locomotives have a rated speed of 8 mi. per hr., at full load, it hardly seems wise to take this as an average running speed for an 8-hr. day. Numerous delays due to lack of cars, derailments and accidents of various kinds are bound to occur in the operation of a mine. For that reason, we would suggest estimating on an average speed of 6 mi. per hr., on the main haulage road.

Again, it is stated that sanding the rails will give an adhesion of 30 per cent of the weight of the locomotive resting on the drivers. As in the

On this basis we have made the following calculation, assuming a speed of hauling of 6 mi. per hr. Referring to the accompanying sketch, the 20-ton locomotive, hauling on the grade between A and B, a distance of 1,760 ft., or $\frac{1}{3}$ mile (round trip $\frac{2}{3}$ mi.), will make $6 \div \frac{2}{3} = 9$ round trips per hour, or $9 \times 8 = 72$ round trips in an 8-hr. day.

To be more conservative, we will estimate on this locomotive making 70 trips a day. But the daily output is 2,500 tons of coal and adding 40 per cent for the weight of the cars, the total weight hauled in a day is 3,500 tons; or $3,500 \div 70 = 50$ tons per trip.

Taking the track resistance as before, 30 lb. per ton, or $1\frac{1}{2}$ per cent, and adding 5 per cent for the grade, makes a total of $6\frac{1}{2}$ per cent of the weight of the cars, or $0.065 \times 50 = 3\frac{1}{4}$ tons, or 6,500 lb., which is the drawbar pull when hauling up this grade.

Again, we may take the gross tractive effort of this 20-ton locomotive as

Estimating the total weight of coal and cars hauled, per day, as 3,500 tons gives $3,500 \div 14 = 250$ tons per trip, which is too great a load for a single trip, such a trip being awkward to handle and requiring long partings. We will therefore use two locomotives on the level haul, each pulling a trip of 125 tons (250,000 lb.). Again, taking the track resistance as 30 lb. per ton, or $1\frac{1}{2}$ per cent, gives a drawbar pull of $0.015 \times 250,000 = 3,750$ lb.

As before, we will assume a gross tractive effort of 25 per cent of the weight of the locomotive, or $0.25 \times 8 \times 2,000 = 4,000$ lb. Then deducting 1 per cent for internal resistance, or $0.01 \times 16,000 = 160$ lb. gives a drawbar pull of $4,000 - 160 = 3,840$ lb., which is also amply large. These results show that one 20-ton locomotive operating on the grade and two 8-ton locomotives on the level haul will suffice.

ARRANGEMENT OF THE SCHEDULE

Referring to the figure, the schedule will be so arranged that, while one 8-ton locomotive hauls a loaded trip from D to B, the other small locomotive will haul an empty trip from B to D, passing the first at C. At the same time, the 20-ton locomotive is hauling smaller trips from B to A.

Assuming that the two 8-ton locomotives are installed at a cost of \$5,000 each and the 20-ton locomotive at a cost of \$8,000, the total cost for these machines is \$18,000, as compared to six 10-ton machines, at a cost of \$36,000, a saving of \$18,000 on this item alone. Using two men on a machine, the operating force is reduced from twelve to six men, at a saving of about \$40 per day, or \$10,000, per 250-day year. Also, in place of seven partings, there will be but four.

To determine the wiring, we must estimate the current required for hauling a loaded trip up the 5 per cent grade and a loaded and an empty trip, respectively, on the level haul.

The haul up the grade we estimated previously as requiring a drawbar pull of 6,500 lb., while the total resistance of the locomotive was 2,400 lb., making a total of 8,900 lb. We estimated the loaded trip on the level to require a drawbar pull of 3,750 lb. and the locomotive resistance was 160 lb., making a total of 3,910 lb. For the empty trip on the level, these items were: drawbar pull 1,500; locomotive resistance 160 lb., making 1,660 lb.

Hauling on the level, the two locomotives are working at less than full load and the speed will be greater, say 10 mi. per hr., which will give a

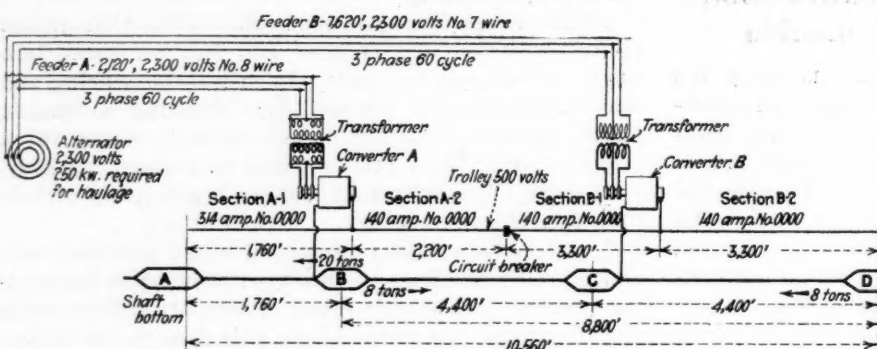


DIAGRAM SHOWING PROPOSED POWER TRANSMISSION ON A 2-MILE HAUL UNDERGROUND

reply given, we will assume that the 5 per cent grade is against the loads and occurs between the shaft bottom and the first parting. This grade is but a short distance (1,760 ft.), a fraction of the total haul.

While it is true that, for a short distance, a locomotive can safely exert a 30 per cent pull, it has occurred to us that it would be more economical to use a heavier locomotive on this section of the road and employ much lighter locomotives on the level haul, instead of making each locomotive haul the entire distance, when it would only work to its full capacity on the grade.

25 per cent of its weight, or $0.25 \times 20 \times 2,000 = 10,000$ lb. But from this must be subtracted 5 per cent for grade and 1 per cent for internal resistance, making 6 per cent, or $0.06 \times 40,000 = 2,400$ lb. resistance, leaving a net tractive effort of $10,000 - 2,400 = 7,600$ lb., which is amply large.

The total length of haul being 2 miles and that of the grade but $\frac{1}{3}$ mile, makes the length of level haul $1\frac{2}{3}$ miles (round trip $3\frac{1}{3}$ mi.) At a speed of 6 mi. per hr., a single locomotive will travel $6 \times 8 = 48$ mi. in an 8-hr. day and be able to make $48 \div 3\frac{1}{3} = 14.4$, say 14 round trips a day.

large allowance for delays from any cause. Multiplying these several tractive efforts in pounds, by the speed of hauling, in feet per minute, and that product by 0.746 and dividing the result by 33,000 and again by the efficiency of the motor gives for the wattage required, in each respective case, the following: Upgrade haul 157,000 watts; hauling loaded trip on level, 70,000 watts; hauling empty trip on level, 37,000 watts.

As shown in the figure, one converter is located at A and a second at a distance of 5,500 ft. away, or 1,100 ft. in by from C. Allowing 360 ft. for extending the conductor, from the generator in the power house, down the 300-ft. shaft to the bottom, makes the length of the feeder A, 2,120 ft. long.

MAXIMUM CONDITION IN SECTION A

The maximum condition in Section A-1 occurs when the 20-ton locomotive reaches the top of the incline, in hauling a loaded trip. Assuming a 500-volt circuit the current required, at this point, is $157,000 \div 500 = 314$ amp. The voltage drop in the rails is about 4 volts. The drop in a 0000-wire is 0.0497 volts, per ampere, per 1,000 ft., making a total of $1.76 \times 314 \times 0.0497 = 27$ volts. This makes a total of $27 + 4 = 31$ volts drop, which is not excessive.

At the same time, an 8-ton locomotive hauling a loaded trip may enter Section A-2, at a distance of 2,200 ft. from the converter. The current required by this locomotive is $70,000 \div 500 = 140$ amp. An 00-wire would give a drop of 27 volts; but, since the remaining circuit requires 0000-wire, we will use that wire throughout the level haul, for the sake of uniformity.

MAXIMUM CONDITION IN SECTION B

At Section B, the maximum condition will occur when the loaded locomotive approaches the circuit breaker; or when it leaves the inby parting D. The current is 140 amp. and the drop at that point 27 volt. The same calculation serves for both branches of Section B.

The maximum power required in Section A is $157,000 + 70,000 = 227,000$, say 230,000 watts, including the inefficiency of the converter. At 100 per cent power-factor, the area of feeder wire for this section is, assuming a three-phase system of wiring

$$A = \frac{2,120 \times 230,000 \times 1,080}{10 \times 2,000 \times 2,000} = 13,164 \text{ circ. mils.}$$

A No.-8 wire, having an area of 16,510 circ. mils will be used. By the same formula a No.-7 wire is found to be sufficient for Feeder B.

A comparison of this arrangement with the one previously outlined shows both the initial cost of the haulage unit and the power required, materially less, while the trolley wire installation is somewhat higher. However, the difference will be greatly in favor of the new arrangement.

CHARLES M. SCHLOSS.

Denver, Colo.

Bent Links in Car Hitchings

Delay caused in gathering trips when car links are bent—How the links come to be bent—Trouble and possible injury in coupling cars.

FOR some time past I have been reading many suggestions by contributors, regarding the more complete extraction of coal, more efficient methods of haulage and other matters in which the operation of mines can be improved. Different writers have told how much time is lost in handling the coal from the face to the tippie. Others have spoken of ways in which time could be gained. I have seen no mention, however, of one thing that has always appealed to me as a chief source of trouble or loss of time, in haulage, in the mine.

All who are familiar with the coupling of cars, in making up trips where the common link-and-pin hitching is in use, cannot fail to appreciate what I have to say in regard to crooked or bent links being a great hindrance in the work. This form of hitching is the one commonly used in coal mines and is far superior to the three links and two clevises sometimes employed.

BENT LINKS THE CAUSE OF MUCH ILL TEMPER AND INJURY

As we all know, car links are bent by reason of their hanging low and not functioning properly when the cars are bumped together by a motorman, in making up a trip. The result is that the oncoming car rides the link that is hanging down, bending it and jamming the bumpers together.

It frequently happens that when the cars are pulled apart the forward car is derailed by falling to one side. This causes serious delay in putting the car again on the track and is almost certain to cause a rise in temperature among the train crew. Each time it happens the links are bent more and more and it becomes extremely difficult to make the coupling.

Many a "snapper" has had his hand crushed when attempting to make a coupling with a bent link. Of course, it will be understood that I am now speaking only of cars having center bumpers and using the link-and-pin hitching. It is a mystery to me that more tripriders and snappers have not been crippled in this way.

At times, a coupling link is bent when dumping a car of rock, at the surface, and attaching a chain to the link to hold the car from going over the dump. The chain should be attached in some other way, as the link is almost sure to be bent by the jerk of the heavy car on the chain.

PROPOSED REMEDY EXPENSIVE

Some will say, "Take all links off when they are bent and send them to the shop to have the blacksmith straighten them. This would be an expense that would cause a howl when the cost-sheet is turned into the office. To straighten the links of three or four hundred cars, in daily use in the

mine, would keep one blacksmith busy and we must look elsewhere for a remedy.

It seems to me, that some means should be employed to avoid links being bent, in the coupling of cars, when making up trips in the mine. It may be possible to design a bumper in a way that will hold the link up, instead of permitting it to hang down. If this can be done in a manner that is simple and inexpensive it will be the means of avoiding much loss of time in the making up of trips, to say nothing of avoiding accidents to tripriders or snappers, who must make the coupling. I hope that some of our practical men can offer suggestions along this line that will eliminate the trouble.

Mayport, Pa. JAMES THOMPSON.

Better Mining and Marketing

Efforts to stabilize coal prices hopeless, until a more constructive agreement is reached between operators and miners—Excessive overhead charges when mines lie idle—High cost of production the result—How long will the public pay these high prices?

NOT LONG AGO, there appeared in *Coal Age* (Sept. 1, p. 325), an editorial entitled "Coal Industry Lags in Merchandising Knowledge," which drew attention to one important factor operating to produce the present high prices of coal.

I recall reading the editorial with deep interest at the time, and am now reminded of it by a second appearing in the issue, Oct. 13, p. 565, entitled "Better Mining and Marketing" and giving a more hopeful outlook for the future of the industry.

The numerous conventions and conferences, held within the past few months for the purpose of discussing coal problems with a view to stabilizing the price of fuel, have succeeded in establishing one fact in the public mind; namely, the industrial wheels have been spragged heavily, by the lack of co-ordination between the operating and the merchandising ends of the industry.

CONSTRUCTIVE PLAN NEEDED

To the suffering public it would seem that, unless a more constructive plan is forthcoming within the next few months, the people will call upon their legislators to take a hand in this merry warfare and put both parties to the controversy out of business. In the minds of many intelligent men interested in the coal business, government ownership of mines is becoming each day, more clearly the only solution.

The city of Windom, Minn., today, is burning coal, at 25c. a bu., under her power-plant boilers. In Iowa and Nebraska, farmers are burning corn in their houses instead of coal. In one instance, I am informed a farmer contracted his surplus of corn, at \$5.40 a ton, to another party for use as fuel. When corn, at this price, can compete with coal, at \$11.50 per ton, it would

seem that the situation is serious enough to require investigation.

Briefly stated, coal operators, with few exceptions, are not running their business to serve the public. The people are anxiously watching as the supply of coal goes down and the price gets higher and higher. While the public are paying from \$8 to \$15 a ton for their coal, the miner is receiving practically the same wages. The benefit of the overcharge appears to be swallowed up in the overhead expenses.

STUDY THE SITUATION

Is it a fact that there are too many mines and too many miners? The army of underground workers has increased until it numbers, today, 600,000 men who are digging coal or performing other work in the mines. Studying the facts, in the light of the contention of the miners that what they want is steady work and the further fact that our mines are running but one or two days a week, makes it appear that there is great need of constructive co-ordination in the industry.

Naturally, the miner will resist any attempt to reduce his wages, as long as there is so little hope of his obtaining steady work. In this locality alone, within a radius of 5 miles, there are five mines, with an average capacity of 4,000 tons per day, or a total output of 20,000 tons of coal mined here in a single day. Each mine employs, on an average, 600 men, making a total of 3,000 mine workers.

At still another mine, 250 men are putting out 1,500 tons of coal a day. This mine, however, shut down, last Spring, for an indefinite time. All of the mines I have mentioned are fully equipped with modern appliances, having been in operation from eighteen to twenty years.

MANY IDLE DAYS AT THE MINES

Last January, work in the mines began to slacken and reached the low ebb in April, since which time the mines have been operating one or, at the most, two days a week. In that time, one mine ran 59 days and another 40 days, the latter having been closed for the past two months, on the plea of making repairs. The other three mines in this district work but little better than the two just mentioned.

Many of the miners here own their own homes and are largely dependent on their labor in the mine. It requires no high mathematics to convince any one that when a mine lies idle for a day or more, the overhead charges still continue and the cost of production is increased. Certainly something should be done to equalize the work and eliminate these idle days.

It would seem that one great need of the coal industry, today, is to combine the various sales departments of different companies into one so-called syndicate, who would be charged with making an equitable distribution of the coal mined, with a view to keeping the mines running on full time.

Staunton, Ill.

PLAYFAIR.

To Mine Large Coal

Points to consider in mining large coal—Drive rooms on face of the coal—In solid shooting, use permissible powder, tamped with clay—In machine mining, drill no hole beyond cutting and avoid excessive charge of powder.

HAVING read with interest the excellent letter of George Edwards, in regard to securing a larger percentage of lump coal, *Coal Age*, Oct. 13, p. 586, kindly permit me to offer a few suggestions from my own experience, in this regard, both in solid shooting and machine work.

In the first place, I have found it of great advantage to advance the rooms on the face cleats of the coal, driving the productive entries on the butts and turning the rooms at right angles to them. When this plan is followed the coal invariably breaks in larger lumps than when the rooms are advanced on the ends of the coal. I regard this as an important point.

Again, the location of the shots and the charging and tamping of holes is important. At least two old experienced miners should be authorized to inspect all holes and give needed instructions to the younger miners, insisting on all holes being tamped with clay to obtain the best results.

In machine mining, no holes should be drilled deeper than the cutting and all shots should be carefully inspected before permission is given to fire. Both in solid shooting and in machine work, care must be taken to avoid excessive charges and only permissible powder must be used.

In my experience, much of the trouble, in mining small coal, comes from the fact that so many miners now working in the mines have had little experience and know particularly nothing as to what is required to gain a larger percentage of lump. Also, many of the older miners have grown careless in this regard since the adoption of the run-of-mine basis of payment.

Crawford, Tenn. OSCAR H. JONES.

Inquiries Of General Interest

Load on Knuckle Sheave, Hoisting on Incline

Load on Haulage Rope Calculated from Track and Grade Resistances of Loaded Trip—Load on Knuckle Sheave the Resultant of Parallelogram of Forces

TO settle a dispute that has arisen between two men, regarding the load on a knuckle sheave when hoisting a trip of five cars up an incline, on a grade of 22½ per cent, I am submitting the question to *Coal Age* for solution.

The sheave at the knuckle is 42 in. in diameter and a 1-in. steel haulage rope passing over it hoists and lowers the trips. Five cars are hoisted at a time, each car weighing 1,100 lb. empty and carrying 2,500 lb. of coal. The entire weight of a loaded trip is, therefore, $5(1,100 + 2,500) \div 2,000 = 9$ tons. Assuming that the trip has reached a point 100 ft. below the knuckle, it is desired to know the load bearing on the sheave wheel at the knuckle.

S. D. HAINLEY.

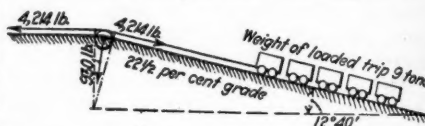
Osceola Mills, Pa.

In solving this problem, we will assume a track resistance of, say 30 lb., per ton of moving load. As usual, the grade resistance is taken as 20 lb., per ton of load, for each per cent of grade. This being a fairly steep incline, however, both the track and grade resistances must be estimated on the normal pressure due to the weight resting on the incline.

A 22½ per cent grade corresponds to an angle of inclination whose tangent is 0.225, or an angle of 12 deg. 40 min.

The normal pressure on this plane is, therefore, $9 \times \cos 12^\circ 40' = 9 \times 0.97566 = 8.78$ tons.

For a grade of 22½ per cent, allowing 20 lb., per ton, for each per cent of grade, the grade resistance is $20 \times 22.5 = 450$ lb. per ton. Adding to this



the 30 lb. per ton, for track resistance, gives a total resistance of 480 lb., per ton of moving load estimated on the normal pressure on the incline.

Finally, then the load on the rope due to both the track and grade resistance is $8.78 \times 480 = 4,214$ lb.

From the parallelogram of forces formed by the two branches of the rope passing over the sheave, each carrying a load of 4,214 lb., the load on the sheave, represented by the diagonal of the parallelogram, or the resultant of the two forces, is $2 \times 4,214 \times \sin \frac{1}{2}(12^\circ 40') = 8,428 \times \sin 6^\circ 20' = 8,428 \times 0.11031 = 930$ lb., nearly, which is the load on the sheave at the knuckle. In this solution, we have ignored the weight of the rope 100 ft. in length, which is comparatively so small as to be inappreciable.

Examination Questions Answered

Tennessee Mine Foremen's Examination, Held at Knoxville, Oct. 18, 1921

(Selected Questions)

QUESTION—*Why does firedamp explode in a safety lamp, without causing an explosion of the gas by which the lamp is surrounded?*

ANSWER—A firedamp mixture, surrounding a good safety lamp, may become highly explosive before slight explosions will be observed to occur within the lamp. Previous to that, the only observed effect is the enlargement and agitation of the wick flame in the lamp, followed by a sharp crackling sound. The gas entering the lamp must be quite "sharp" and reach the maximum explosive point, before any explosion can take place in the lamp. Then, only slight balloons of flame will form and explode in the lamp.

The reason is that the condition within the lamp is modified and rendered less explosive by the admixture of burnt air consisting of variable portions of nitrogen and carbon dioxide. Owing to the presence of these extinctive gases, an explosion within the lamp must be very violent before it will have sufficient force to drive the flame through the gauze of a good lamp and ignite the gas outside.

QUESTION—*Are there any conditions under which it would be unsafe to use a safety lamp? If so, name them.*

ANSWER—Yes. A safety lamp is never safe except when handled by an experienced man who understands all the conditions that must be observed to insure safety. A lamp is never safe when exposed to a strong air current or rush of air, or when exposed for too long a time to a firedamp mixture surrounding it, or when defective in any way, due to the gauze being injured or the lamp improperly assembled. The lamp is not safe if it is tilted so as to permit the flame to impinge against the glass or the wire gauze, or if permitted to fall. It must be kept clean and carefully examined previous to use.

QUESTION—*What effect would carbon dioxide have on marsh gas when these are mixed together?*

ANSWER—Carbon dioxide being an extinctive gas produces a depressing effect on the inflammable or explosive condition of marsh gas. If carbon dioxide is added to a mixture of marsh gas and air at its most explosive point, in the proportion of one volume of carbon dioxide to seven volumes of the firedamp mixture, it has the effect of rendering the mixture non-explosive.

QUESTION—*What percentage of firedamp do you consider the most danger-*

ous; and what gases enter into the composition of firedamp and in what proportion?

ANSWER—A mixture of pure methane and air (firedamp) containing more than 9½ per cent of gas; or, in other words, above its maximum explosive point, is more dangerous in a mine than a mixture below the maximum explosive point. The reason is that any addition of air to the former, which is liable to happen in the mine at any time, will make it more explosive, while addition of air to the latter makes it less explosive. The most violent explosion occurs when the mixture contains 9½ per cent of gas.

The term firedamp, in this country, refers to any inflammable or explosive mixture of air and gas. Commonly speaking, it is a mixture of pure methane and air, in any proportion between the lower and higher inflammable limits. At the lower limit, the mixture consists of one volume of gas to forty volumes of air, while the proportion of gas to air, at the higher inflammable limit is 1:2.4. The former contains 2.5 and the latter 29.5 per cent of the gas. Any mixture lying between these two limits is either inflammable or explosive and is properly termed "firedamp."

QUESTION—*What noxious gases are produced by fires and explosions of firedamp, in mines?*

ANSWER—The chief gaseous products of fires or explosions of gas, in mines, are carbon dioxide and carbon monoxide, the proportion of the two gases produced being dependent on the quantity of air present at the time, which determines whether the combustion is complete or only partial. A plentiful supply of air insures complete combustion and carbon dioxide only is produced. On the other hand, if the supply of air is limited, the combustion is not complete and some carbon monoxide results.

QUESTION—*State your views as to the cause of explosions and what precautions you would adopt to prevent them?*

ANSWER—The primary cause of a mine explosion is the ignition of gas or dust, mixed with air in such volume and proportion as to produce a sudden and violent combustion. Whenever undue accumulations of gas or dust are permitted in the mine and there is danger of these being ignited, by the flame of a shot or a lamp or the sparking of wires, an explosion is imminent.

In order to avoid the danger of an explosion of gas or dust, strict rules and regulations must be made and enforced, in respect to the examination of all working places at regular intervals. No accumulations of dust must be permitted at the working face or on the roadways; and, if necessary, these must be cleaned and sprinkled at regular intervals. If the mine is generating gas, all holes should be examined, charged and fired by competent shotfirers. Special attention must be given to the ventilation of the mine and safety inspectors should be employed to examine all working places, at brief intervals throughout the day, while the men are at work.

QUESTION—*Would you consider a dusty mine dangerous though not generating gas?*

ANSWER—Yes; if not properly inspected and managed, a dusty mine is dangerous, even though free from gas. The fine dust of an inflammable coal, thrown into the air by a blowout shot and ignited by the flame projected into the dust cloud, will start an explosion that may be propagated throughout the mine.

QUESTION—*Explain the principle of explosion doors, in connection with the ventilating apparatus of Class-A mines.*

ANSWER—The purpose of explosion doors in mines generating gas and specified as "Class-A Mines," in the Tennessee law, is to relieve the pressure due to a possible explosion and thus prevent the damage that would otherwise be done by the blast. In the majority of cases, where explosion doors are not provided in the fan drift, for the protection of the fan in case of an explosion, not only the drift leading to the fan but the fan itself will generally be destroyed. The blowing open of the explosion doors prevents this destruction.

QUESTION—*Upon entering a mine in the morning, you find it generating gas; how would you make your inspection, with the air or against it?*

ANSWER—The only safe way to inspect a mine that is generating gas is to proceed with the air. By so doing, the fireboss has a safe retreat open to him, at all times, and is not in danger of being surrounded by the gas provided he takes the necessary precautions to avoid such an occurrence. On the other hand, when advancing against the air the fireboss is liable to be trapped, there being no way of escape open to him when he reaches the gas.

QUESTION—*Should a fireboss report dangerous conditions owing to gas and dust in a portion of the mine, what precautions should the mine foreman take to safeguard the employees?*

ANSWER—Much will depend on the conditions that exist in the mine. The duty of the foreman, when informed of a dangerous condition existing in a certain section of the mine, is to promptly withdraw the men from that section and, if necessary, from the entire mine, before taking any steps to remove the danger. In performing that work, employ only experienced men.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

THERE are multiplying evidences that domestic business has "turned the corner" and is gradually but surely emerging from the deflation period that began about the middle of last year, according to the current issue of *The Guaranty Survey*, the monthly review of business and financial conditions issued by the Guaranty Trust Co. of New York. Two outstanding indications of the improvement are cheaper money, with its concomitant easier credit, and the more or less widespread industrial revival.

"A building boom is sweeping the country," the *Survey* continues. "There is decided betterment in the textile trades and the shoe and leather industries report progress. Our surplus copper is gradually being marketed at prices that tend upward. There is increased output of iron and steel, and the railroads are coming back into the market. Business failures are less numerous. Unemployment generally is decreasing, and savings are increasing.

"The banks of the country have been able, since the establishment of the Federal Reserve System, to aid in effecting a more orderly general readjustment of industry following a period of inflation than was possible so long as our banking system remained extremely decentralized. Such service, particularly in the last year and a quarter, has been of incalculable benefit to the nation's business. But the avoidance of a general collapse of credit, such as was repeatedly experienced before the organization of the Federal Reserve System, has necessarily tended to prolong the period of readjustment.

"Meanwhile, through the gradual liquidation and utilization of accumulated stocks of commodities, the way has been prepared in a number of industries for an increased volume of production for current consumption. The check to the downward course of general prices in this country and abroad has lessened the incentive to defer contemplated purchases, and this condition supplements the depletion of hold-over stocks in creating an enlarged demand for current production.

"How prolonged will be the period required for the complete resumption of the country's business activity on a normal scale must depend in considerable degree upon the progress of industrial and financial recuperation in other countries which consume American products."

Roads Place Big Equipment Orders

Equipment and rail orders awarded by the leading railroads of the country during the last month or so are estimated at \$50,000,000, with inquiries now in the market on orders valued at half that amount. Additional orders for 400,000 tons of rails are pending, and steel and equipment manufacturers are expecting a record year in purchases for 1922. Orders are expected to come in speedily as soon as Congress passes the railroad refunding bill, which will greatly assist the roads in financing their requirements.

The Texas & Pacific Railroad Co. is reported to have placed an order for 15,000 tons of steel rails with

the United States Steel Corporation for delivery next year.

The American Locomotive Co. has closed a contract for fifteen 145-ton Mikado and ten 158-ton mountain type locomotives for the Seaboard Air Line. It is estimated that the contract calls for the expenditure of about \$1,250,000 by the railroad.

Orders for 127 modern steel passenger cars have been placed by the Chicago, Burlington & Quincy R.R., it was announced Nov. 29.

Jersey Mills Reopen

The Argo Mills Co. announced last week that work would be resumed at its Gloucester (N. J.) plant within a few days.

Freight-Car Loadings Gain 33,625

Loading of revenue freight during the week ended Nov. 19 totaled 786,671 cars. This was an increase of 33,625 cars over the week before, when loadings were reduced by the observance of Armistice and Election days. Tabulations show, however, that while the total for the week of Nov. 19 was greater than for the week before the average per day was less. Compared with the corresponding week last year the total for the week of Nov. 19 was a reduction of 102,467 cars, while it was 67,930 cars less than for the corresponding week in 1919.

Harvester Works Back to Normal

That the Springfield (Ohio) works of the International Harvester Co. would resume practically normal operation within a week was announced Dec. 1 by Plant Superintendent Charles Smart. About 700 men will be employed. Increased orders from dealers warrant the action, according to Mr. Smart.

Cotton Mills Work Full Time

For the first time in several months the cotton mills at Fall River, Mass., which are controlled by the Knights Corporation have resumed full-time operation and the management announces that it is looking forward to marked improvement in the cotton industry in the near future.

Less Idleness in Pittsburgh

That unemployment continues to decrease in the Pittsburgh district is indicated by the semi-monthly report of the Pennsylvania Bureau of Labor and Industry, which shows that as of Nov. 15 there were 51,400 men out of work in that district, as compared with 52,400 Nov. 1 and 55,050 on Oct. 15. The report also shows that in the Johnstown district unemployment increased from 7,810 Nov. 1 to 8,985 on Nov. 15. The total number unemployed in the state as of Nov. 15 was 271,430, as compared with 276,350 Nov. 1 and 288,625 Oct. 15.

Blast Furnaces Resume Operations

The Steel & Tube Co. of America, Chicago, according to the *Iron Age*, having completed overhauling and improving its blast furnaces and coke plant at Mayville, Wis., formerly known as the Northwestern Iron Co., expected to resume operations Dec. 1 with a normal force.

Willys-Overland Sales Still Good

The Willys-Overland Co. at Toledo reports but slight cessation of selling activities with the advent of winter. The good business of the autumn is still continuing and the prospects for the new year are exceptionally bright.

Competitive Costs and Marketing Methods in the Sale of American Coals Abroad*

Overseas Trade of 1,500,000 Tons Monthly Would Give Employment to Idle Mines and Ships — Reduced Overhead in Mining Industry and Lower Freight Rates to Tidewater Also Likely

BY CHARLES A. OWEN

THE average person in the United States must be confused by the complicated and generally unintelligible statistics and statements made and published from time to time of our exports, and more particularly our coal exports. We have been led to believe that the large and profitable export business of the past five years could be expected to continue indefinitely without the careful study of economic conditions both here and abroad and the working out of a broad policy necessary to its permanency.

The coal industry, like all others, has had attracted to it a great number of speculators, whose sole purpose was to make money while the high prices prevailed, without the organization and expense necessary to the building up of a permanent business. The situation here has not been unique, however, as in England, France, Holland, Italy and other European countries the same conditions existed.

The statistics stated will be for bituminous coal only, and as this discussion is limited to overseas trade I shall exclude tonnage exported to Canada, which amounts to approximately fourteen million tons per year, and also tonnage exported to South America, Central America, Mexico and the West Indies, amounting to 3,500,000 tons to 5,500,000 tons annually during the past five years. This business, amounting to a total of approximately eighteen million tons annually, should be retained by us at all costs. (Bunker business amounting to six million to nine million tons annually, which we can expect to retain, is not included in this article). Similar methods of marketing and co-operation by all concerned must obtain for these markets as for the overseas trade.

Coal for export overseas originates generally from the States of Pennsylvania, West Virginia, Maryland, Virginia and Kentucky, as the mines in these states carry the low transportation rates to tidewater. The railroads serving these fields have excellent port facilities for efficient loading of vessels. The present capacity of the railroads and piers is much greater than we will need if the loading demand is fairly evenly distributed throughout the twelve months of the year. These districts produce normally about 280,000,000 tons annually and contain both low-volatile and gas coals of superior quality which can compete favorably with the best coals produced abroad. During the year 1920, when we exported overseas about 20,000,000 tons, we drew from these districts approximately 7½ per cent of the tonnage produced.

AMERICAN AND BRITISH EXPORT TRADE COMPARED

A comparison of figures of production and consumption of bituminous coal of the countries comprising our overseas market, exclusive of Great Britain, shows a shortage of production normally of from 35,000,000 to 40,000,000 tons annually. Great Britain is our competitor for this trade. Great Britain's production varied from 287,000,000 tons in 1913 to 240,000,000 tons in 1920, from which was exported from 72,000,000 tons in 1913 to 25,000,000 tons in 1920. Our overseas exports of coal for the same years were from 2,000,000 tons in 1913 to 20,000,000 tons in 1920, and for the seven months ending Aug. 1, 1921, about 8,000,000 tons, of which approximately 2,000,000 tons were shipped to Great Britain during the strike. During the month of September our overseas shipments dropped to 300,000 tons. I have given you these figures to separate our overseas business from the total tonnage exported.

*An address delivered at the twenty-fourth annual convention of the American Mining Congress, Chicago, Oct. 17-22, 1921.

France has been the largest purchaser of coal, consuming an average of over 15,000,000 tons above production. The remainder of the normal demand is mainly in Holland, Norway, Sweden, Russia, Germany, Switzerland, Italy and Mediterranean countries. Europe will not increase its coal production above pre-war figures for a great many years, and I believe that, if handled carefully and intelligently, we can do an overseas export business of from 10,000,000 to 15,000,000 tons annually of American coal. Our ability to retain this trade from year to year will, of course, first depend upon our being able to furnish quality, service and competitive c.i.f. prices.

By furnishing quality we mean good grades of coal, well prepared, screened if so desired, and this quality maintained through shortage of production, giving the same attention to the foreign customer that we are giving to our customers at home, being willing within reasonable limits and tolerances to guarantee our product. There has been a great deal said about the dissatisfaction in Europe with the quality of American coals, but I find that generally the overseas trade which we have supplied like our coals and with comparatively few exceptions are satisfied with the quality of the product we have furnished. We cannot expect our foreign customers when paying railroad and water freights in amount three or four times the value of the coal at the mines to accept an inferior quality of coal. England has always recognized this fact and has given her export business the best grades of coal produced. The overseas market requires a great deal of large or lump coal and our important domestic consumers should be educated to the use of slack coal instead of run-of-mine, stokers being now generally used in our large plants.

SUCCESS IN EXPORT TRADE DEPENDENT ON SERVICE

Service is most essential to the success of our overseas trade. Prompt, careful and intelligent handling of cables, orders and letters, accuracy and care in fixing of charters and dispatch in loading are all-important. The foreign buyer is much more particular than the domestic buyer and not inclined to overlook errors or negligence on the part of the supplier. Here the English excel us because most of the exporting houses are old establishments with well-trained employees, familiar with all the details of the shipping and export business and with a definite knowledge of how to please each customer. It must be remembered that few of the producers of coal in this country have had much experience with the laborious but necessary details of the shipping and banking business which are a part of every export shipment. Competitive prices are the most difficult, not so much on account of our production costs but because of the many factors entering into the final c.i.f. cost.

A comparison of mine or transportation costs from available statistics means very little, as all prices are too unbalanced. The mine costs from the Eastern producing districts have varied from an average of about \$1 per ton in 1913 to as high as \$3.50 per ton in 1920 and are today approximately \$2 per ton. Railroad freights are about double the 1913 rates. Ocean freights have dropped from a peak of \$30 or more a ton to \$5 a ton, and all other charges including profit have varied accordingly. The value of our bituminous coal f.o.b. ports from which shipped, 1913 to 1916, was about \$2.50 a ton; in 1919, \$4.70 a ton; in 1920, \$8 a ton and today it is about \$5 a ton. English coal for the year 1913 was valued at 14s., or \$3.50, a ton, while during the year 1921 to Aug. 1 the

range of value was from £3 5s., or \$12.35, a ton, to an average for the month of August of £1 16s., or \$6.85, a ton. These figures show our value at tidewater approximately \$2 a ton below the English value, even with the British Government subsidy on labor costs and the practice of the English exporter to make the export price a competitive one at the expense of the domestic consumer.

Costs during the past five years of English coal are exceedingly difficult to obtain and mean little to us. This fact, however, is clear—if England, by subsidy, whether it be by labor, on shipping, or otherwise, delivers its coal at a lower price than cost to the foreign market, then we must either do the same thing or have an arrangement with England by which certain markets will be open to us with clean and fair competition based on actual costs delivered. If this is done we can easily compete successfully for a fair share of the overseas trade, which we need and should enjoy, provided our costs are brought down to a proper level.

LABOR, AS USUAL, THE BIGGEST ITEM OF COST

Coal costs c.i.f. depend largely on four items of which labor makes up approximately 70 per cent of the total. These are f.o.b. mine cost, railroad freight to tidewater, ocean freight and overhead charges and profit. Labor must be reduced throughout the Eastern districts as soon as possible to the 1917 level or lower, so that total costs f.o.b. mine will be not more than \$1.50 to \$1.75 per ton. Railroad freight rates should be reduced on coal for export to a maximum of \$2 a ton, and while water freights are as low as possible under our present government regulations, our laws should be changed so that our merchant marine, which should be privately owned and managed, can compete under our flag with the ships of other flags. I believe it possible to reduce our rates from 50c. to \$1 a ton if restrictions are removed now in effect under the LaFollette law. It is now profitable for us to deliver good grades of steam or gas coal to Mediterranean ports at from \$10 to \$11 a ton as against English quotations of \$9 to \$10 a ton.

Let us consider further our English competition. The settlement of the English coal strike in July was accomplished by the granting by the government to the miners of a £10,000,000 subsidy which was to be used for the purpose of paying labor a certain portion of the difference between the wage scale offered by the mine owners and that asked by the mine workers. At the end of three months' operation every mine owner was dissatisfied, the government fund was practically exhausted and the cost of coal to the English consumer was too high. They have, however, regained their export trade and are now shipping to foreign markets three and a half million tons monthly.

EXCHANGE SITUATION HAMPERS AMERICAN COMPETITION

The greatest factor against us in competition for foreign trade is the high value and constant fluctuation of the dollar in exchange. This adds actually almost 20 per cent to our delivered prices. You can, therefore, see that under present conditions it is very difficult for the American exporter of coal to compete with England.

I have great admiration for the English people but it is not clear to me why we should continue to finance England and allow her to use our money for subsidies which have the effect of excluding our coal from the European trade, thus driving our coal-carrying ships from the seas. If subsidies are necessary in order to allow us to compete, let us have subsidies in the form of reduced freight rates, both railroad and ocean. Thus our mines will be given the extra work and our merchant marine, which we should keep at all costs, will operate.

The principles of marketing coal for export are similar to those necessary to successful salesmanship in the domestic market. I am convinced it requires American management and, as far as possible, American salesmen. This necessitates the settling of our young men permanently in the centers of activity, learning to speak the native language fluently, becoming on friendly terms with the business men of the community, and becoming a part of the country. I think it better to have offices rather than agents and do as much business as possible direct with the

consumer. This is a slow and tedious undertaking but certainly pays in the long run. Some of our most prominent exporters have followed this plan successfully and American coal offices can be seen in all the principal cities of Europe.

English exporters have a decided advantage on account of the short distance to their European markets and also because of prompt delivery. They can deliver coal to practically all European ports within ten days to two weeks of receipt of order. Our delivery requires about double this time. The chance of fluctuation of exchange or market prices is not so great. Another feature is the matter of small cargoes. Our deliveries are mostly in large vessels in order to get the advantage of low freights. Comparatively few consumers can handle this amount of coal at a time, requiring the splitting of the cargo to two or more customers. The English cargoes are smaller, necessitating less of this undesirable work and added expense. The greatest advantage at present, however, is the friendly status personally of the English manager, who has established himself just as our managers must do. The problem of overseas coal exports is primarily ours, but as its success is of such prime importance to all, our government at Washington should co-operate with us so that the problems that appear from day to day may be worked out with its co-operation. The coal exporter must be encouraged and helped, as the profit he receives will be small compared to the benefit to the country at large.

The banking business of the country must get a better understanding of export business and cease to be merely a collection agency. The information given relative to credits should be more thorough, so that losses will be at a minimum and if credits be extended it must be with their help and co-operation.

INVESTMENT IN FOREIGN ENTERPRISES HELPFUL

The foreign branch of the American banking institution I believe an excellent thing and it is to be hoped that through this influence our people will invest more and more in foreign enterprises. Both Germany and England's strength, both countries having shown what real value exports are to the people of their country, have in the past encouraged investment in the railroads, public utilities and industries of the country with which trade was desired. Their people become a part of the banking, industrial and social life wherever they are and one might say they are trading with their own interests. Financial interest in a project gives the investor a voice in its management and it naturally follows that through an advantage of this sort a great deal of foreign business is done.

It in a way gives to the business men of the investing country the refusal of the business at the competitor's price. This has always been true of the export coal business of the principal industries of South America and governs a great deal of the European business today. As we encourage our industries to bid for foreign trade, investment of our money will naturally follow as our men become established and business will increase rapidly on this foundation. When we think of establishing an additional office in this country for the purpose of increasing our sales, the territory is first worked out carefully so as to be sure of sufficient business of the kind suited to the coals we handle to warrant the expense necessary to a permanent establishment. We next pick the man whom we think is best suited to this territory, and certainly great care is used in this selection, as he is to be the foundation of the business. We then unpretentiously set out doing missionary work, getting acquainted, and during the first year do very little business.

As our manager becomes acquainted we form a banking connection in the city in which the office is located. In time our man becomes a member of the principal club or clubs, learns to know his competitors, the banking and business men of the district in which he has been placed, and at the end of two or three years is firmly established and doing a profitable business. The sale of coal and American products in export trade can be permanently established only by this same method, unless the difficulties to be overcome are greater and the adaptation of our men

to the situation more difficult. The whole problem becomes more complex and several years may elapse before the foreign branch is on a permanently paying basis.

During the year 1918 Congress passed the Webb law, allowing combinations in industry for the purpose of foreign trade. Several combinations have been formed under this law and meetings have been held by those interested in the export of coal upon the call of the export committee of the American Mining Congress. The coal trade failed to work out a satisfactory plan of organization and the matter was dropped. I believe this was a mistake. We should have co-operation either through a combination or pooling of interests or by the establishment of a coal export association composed of all those interested in coal exports. Such an association, with the help of the export committee of this body and the National Coal Association could accomplish great things in the working out of our problems and would be beneficial to all those in the industry, large and small. For the average producer of coal the export business has little interest. If he were to explain this lack of interest he would point to the small

percentage of our production involved and the difficulties connected with the business. However, an overseas export of coal of 1,500,000 tons monthly would give employment to approximately 20,000 idle mines and more than one-fourth of our idle ships and would bring to this country in exchange for the labor and service \$15,000,000 monthly. Not only would the coal trade benefit directly, but the business of the entire country would be accelerated.

Summing up, we should have:

Reduced wages of mine workers and overhead costs.

Reduced freight rates for coal to tidewater for export.

A definite plan for payment of the Allies' debts to the United States, which would stabilize exchange rates.

A revamping of laws governing shipping, so that ships under our flag could compete unrestrictedly with those of foreign flags.

Co-operation in the coal industry so that problems of the export trade could be presented at all times as a unit.

Immediate action looking to a solution of these problems is necessary if we are to compete successfully in the overseas coal export trade.

N. Y. Interborough Roads Use 770,000 Tons of Coal, at \$7.35 Per Ton; B. R. T. Fuel Costs \$6.93

SOME INTERESTING information concerning the coal consumed by the Interborough Rapid Transit Co., and the prices paid was elicited from Frank W. Hedley, president of that corporation, during his examination on Nov. 28, by the Transit Commission in its inquiry into the New York transit situation.

Contracts for supplying the 770,000 tons or more of coal required have been made for a number of years with the Consolidation Coal Co., Berwind-White Coal Co. and the Logan Coal Co., but for the past two years, Mr. Hedley said, the full needs of the company have not been contracted for, about 10 per cent of the tonnage required having been bought in the open market. As a result of buying distress coal at various times, Mr. Hedley said, he has been able to purchase at \$5.50 a ton coal which sold in New York harbor during the war for \$20 a ton.

Mr. Hedley, replying to former Supreme Court Justice Clarence L. Shearn, counsel for the commission, said that the contracts now in force provide for a sliding scale of prices. Regarding this feature Mr. Hedley said:

"The contract that we are running on now from the two large companies—that is, the Consolidation Co. and the Berwind-White Co.—contains a minimum and maximum quantity of coal that we are to take. That is, we must take the minimum and we have the privilege of taking the maximum. That gives the company an opportunity of still continuing to buy spot coal in the harbor here, if it can get coal cheaper than its contract price; and if the coal should go up, then the company has the advantage of calling upon our contractors to furnish the maximum at the contract price."

"But I do not understand the sliding scale yet," said counsel.

"Well, the sliding scale part of it is that the price is fixed per ton—that is, the long ton, 2,240 lbs.—delivered at the pier at each of our power houses."

"That is for a year?"

"Per ton per year, yes; and if the price of labor at the mines goes down—in other words, if the cost of producing the coal out of the mines into the cars is reduced by means of reduction of labor costs—the company gets the entire benefit in the reduction of its price of those labor costs. Should there be any reduction in the freight rates, which I personally feel that we are certainly going to get, the company will get all the advantage in the reduction in the freight rates. If there is any reduction in war tax, the company will also get that. But, on the other hand, if there is any increase of labor, any increase in freight rates, any increase in war tax, the company will have to pay that

much more for its coal. I feel that is all in favor of the company getting coal cheaper."

Mr. Hedley said that the contract had been approved by the commission and that the coal companies had agreed that if a concern buying a similar quantity and character of coal should get a better price, his company should have the same advantage. He said that the price for the coming year's contract was \$6.95, as compared with \$7.70 last year, and that he thought "personally we are going to get a dollar off it within the next year."

The average price of coal for subway and elevated roads during 1921 was \$7.35, while during the same period the average cost to the Hudson & Manhattan Co. is \$3.82 per ton. Asked to explain the difference in cost Mr. Hedley said the coal for the Hudson & Manhattan Co. is delivered in New Jersey; there are no unloading charges, no pier charges, no lightering charges and no harbor charges. He added, in reply to questions, that "the only way they could possibly have got that \$3.82 price was by a long-term contract made prior to the war. There is no contract, I believe, that could have been made by any person, even with Jersey City delivery, for the character of coal that we use at anything like the prices you have mentioned."

"Apparently," said Mr. Shearn, "that was not the result of the long-term contract made before the war, because in 1914 their price was \$1.69 a ton; 1915, \$1.62; 1916, \$1.61; 1917, \$2.19; 1918, \$3.72; 1919, \$3.83 and 1920, \$3.58."

Mr. Hedley said the Interborough Co. bought "navy coal" and that if the Hudson & Manhattan Co. bought "the same kind of coal as we buy, I would say that I don't believe the figures you have quoted are correct."

Mr. Hedley was told that the reports showed that the Brooklyn Rapid Transit Co. was paying this year \$6.93 per ton for its coal, as compared with \$7.35 paid by the Interborough Co., that the average price for the Interborough coal in 1920 was \$5.74 and the B.R.T.'s \$5.35, and in 1919 the average prices were \$5.41 and \$4.81, respectively.

"There is no reason that you can think of, is there, why there should be that difference in price?" asked Mr. Shearn.

"No," replied Mr. Hedley; "they get their coal from the Consolidation Co. and from the Berwind-White Co. I don't know whether they get it from anyone else or not."

Continuing Mr. Shearn said:

"Well, it appears that there is this difference year by year as you go back. In 1917 you were paying \$3.07 and the B.R.T. was paying \$2.55. Well, there is not very much difference there. In 1916, as I say, you were paying \$2.93 and the B.R.T. was paying \$2.35; in 1915 you were paying \$2.90 and the B.R.T. was paying \$2.28."

Record Peace-Time Reserves of Coal Disclosed by Survey of Stocks November 1

Surplus of Bituminous About 47,000,000 Tons—Decreased Rate of Consumption Makes Number of Days' Supply Unequalled—Utilities Well Fortified—Northwest and New England Have Abundance

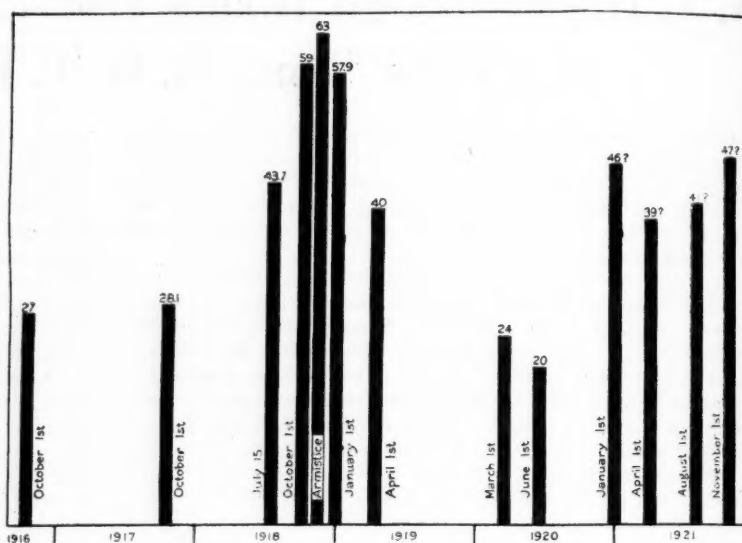
STOCKS of bituminous coal in the United States on Nov. 1, 1921, are estimated by the Geological Survey and the Census Bureau, after a joint investigation, at 47,400,000 net tons, sufficient for 43 days' requirements at the average rate of consumption in the three months August to October inclusive. Although the total quantity on hand, exclusive of coal in transit, on Nov. 1 was less by 16,000,000 tons than the 63,000,000 tons of stocks two years previously on Armistice Day, the estimates of the government are that, because of the decreased rate of consumption obtaining this year, the present storage is equivalent to the requirements of 43 days compared with 45 days two years previous; 42 days on Jan. 1, 1919; 31 days on April 1, 1919; 18 days on March 1, 1920; and 15 days on June 1, 1920. The estimates for 1921 indicate the supply on Jan. 1 sufficient for 39 days; on April 1, 36 days; Aug. 1, 39 days; Nov. 1, 43 days.

Because the abnormally low rate of consumption in 1921 is such a large factor in calculating the stocks in terms of days' supply it is significant to note that supply in tons, now around 47,000,000, was exceeded in the autumn and winter of 1918, but at no subsequent or previous time, according to available records. What is true of the country as a whole with respect to stocks of bituminous coal is also true with respect to individual industries. Byproduct coke plants and steel mills report a smaller quantity of coal on hand than at the peak in November two years ago, but quantities which at the reduced rate of operation insure a greater number of days' supply than any previous period recorded. The same is true of public utilities, both gas plants and central power stations.

Stocks of coal in the hands of retail dealers are shown by the report of the Geological Survey and Census to be sufficient for an average of 47 days at the rate coal was distributed in the three months ended Nov. 1. The dealers handling bituminous received more than they distributed in that three month period, whereas dealers handling

anthracite distributed slightly more than they received, their stocks decreasing from an average of 50 to 47 days.

These figures are, of course, for the United States as a whole and there are many variations when local conditions are taken into consideration. Some of these variations are shown by the accompanying diagrams. Even the figures for the states are averages, and it follows that many individuals, both among industrials and retail dealers, as well as their customers the householders, are far below the average. The accompanying tables, showing the days' supply of bituminous coal in the hands of consumers in each state, give an indication where was placed a considerable portion of the more than 6,000,000 tons storage by which



TOTAL COMMERCIAL STOCKS OF BITUMINOUS COAL, OCT. 1, 1916, TO NOV. 1, 1921

Figures represent million net tons and include coal in hands of railroads, industrial consumers, public utilities and retailers. Coal for steamship fuel, on Lake docks, and in transit is not included. Figures for 1921 are subject to revision.

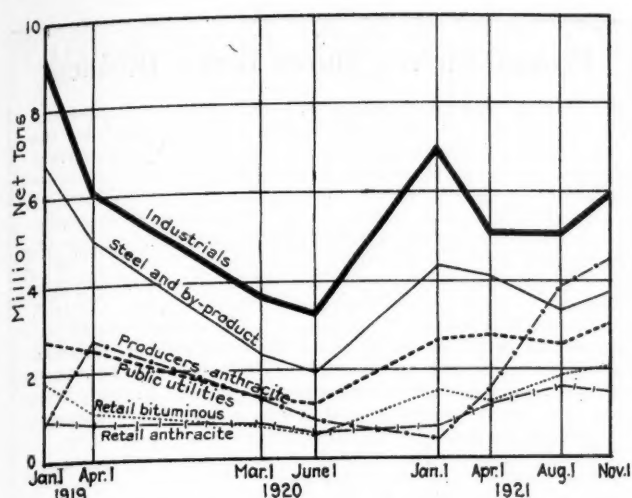
DAYS' SUPPLY OF COAL ON HAND, RECEIPTS AND CONSUMPTION OF CERTAIN REPRESENTATIVE CONSUMERS, AUG. 1 AND NOV. 1, 1921 (Based on all reports received from selected lists of consumers up to Nov. 25, 1921. Figures in days and net tons)

	Industries Other Than Steel and Coke	Steel Works	Byproduct Coke Plants	Coal Gas Plants	Electric Public Utilities	Retail Dealers Bituminous	Total Bituminous (Excluding Railroad Fuel)	Retail Dealers Anthracite
Number of plants reporting.....	2,330	216	70	111	790	1,293	4,810	841
Stocks on hand Aug. 1, 1921.....	5,758,886	1,814,289	2,327,320	700,775	3,175,167	2,119,357	15,895,794	2,049,490
Received Aug. 1 to Oct. 31.....	10,715,626	3,634,992	7,324,499	886,501	7,332,206	4,900,656	34,794,480	3,653,707
Consumed Aug. 1 to Oct. 31 including yard losses.....	9,537,210	3,624,783	6,833,734	814,228	6,609,042	4,694,408	32,113,405	3,785,569
Stocks on hand Nov. 1.....	6,937,302	1,824,498	2,818,085	773,048	3,898,331	2,325,605	18,576,869	1,917,628
Daily consumption Aug. 1 to Oct. 31.....	103,665	39,400	74,280	8,850	71,837	51,026	349,058	41,148
Days' supply Aug. 1.....	56	46	31	79	44	42	46	50
Days' supply Nov. 1.....	67	46	38	87	54	46	53	47

TONS OF COAL IN HANDS OF SELECTED LISTS OF IDENTICAL CONSUMERS WHO REPORTED ON EACH OF EIGHT DATES, JAN. 1, 1919 TO NOV. 1, 1921 (In Net Tons)

	Number of Identical Establishments Reporting	1919 Jan. 1	1919 April 1	1920 March 1	1920 June 1	1921 Jan. 1	1921 April 1	1921 Aug. 1	1921 Nov. 1
Byproduct coke plants.....	57	3,381,140	2,383,305	1,210,000 a	800,000 a	2,261,039	2,256,007	1,640,109	2,020,884
Steel plants.....	215	3,448,850	2,626,596	1,130,000 a	1,168,000 a	2,051,932	1,830,724	1,695,726	1,732,295
Other industrial plants.....	2,061	9,138,191	6,065,104	3,650,945	3,247,370	7,018,126	5,100,982	5,074,124	5,956,970
Coal-gas plants.....	108	691,183	597,636	286,679	195,941	573,611	674,566	700,487	772,129
Electric utility plants.....	256	2,098,978	1,927,929	1,069,866	1,049,793	2,101,007	2,103,223	1,868,743	2,255,046
Retail coal dealers.....	1,080	1,817,117	1,136,788	758,924	535,218	1,514,382	1,274,828	1,844,349	2,066,077
Railroads.....	100	11,742,847	(b)	3,520,385 c	2,898,057 c	7,542,247	7,540,380	(b)	8,958,389
Total bituminous.....	3,877	32,318,306	23,337,000 b	11,627,000 d	9,895,000 d	23,062,344	20,780,710	20,574,000 b	23,761,790

(a) Includes estimates for so large a number of plants that the total is subject to a possible error of 20 per cent. (b) No data available for railroad fuel on this date. Estimate included in total. (c) Because of differences in form of reports, data are not entirely comparable with those on other dates shown. The 1920 figures are, if anything, low. (d) Subject to errors mentioned in notes (a) and (c); probably low.



FLUCTUATIONS IN TONNAGE OF COAL IN STORAGE,
JAN. 1, 1919, TO NOV. 1, 1921

Lines in diagram show tons on hand at selected lists of establishments on dates mentioned. The lists are incomplete but as the same establishments are included for the several dates the figures are comparable.

DAYS' SUPPLY OF SOFT COAL IN HANDS OF REPRESENTATIVE
INDUSTRIAL CONSUMERS AND PUBLIC UTILITIES,
AUG. 1 AND NOV. 1, 1921

(Figures represent number of days stocks would last at current rate of consumption, a)

State	Industries Other Than Steel and Coke			Electric Utilities			Coal-gas Plants		
	Plants Re- porting	Days' Supply Aug.	Days' Supply Nov.	Plants Re- porting	Days' Supply Aug.	Days' Supply Nov.	Plants Re- porting	Days' Supply Aug.	Days' Supply Nov.
Maine.....	28	97	127	2	56	47	2	162	177
New Hampshire.....	32	131	141	4	83	55	1	71	52
Vermont.....	42	124	122	(b)	(b)	(b)	(b)	(b)	(b)
Massachusetts.....	280	116	125	45	99	111	10	85	93
Connecticut.....	72	167	173	15	52	48	2	107	122
Rhode Island.....	59	121	132	4	40	72	1	92	85
Total	513	124	135	70	83	90	16	93	102
New England.....	154	69	87	23	36	41	4	114	123
New York.....	97	73	79	25	110	105	1	29	26
Pennsylvania.....	124	41	48	48	47	55	3	72	75
Maryland.....	31	29	33	12	32	59	3	59	73
Delaware.....	24	64	76	2	33	38	(b)	(b)	(b)
District of Columbia.....	9	10	40	2	22	22	(b)	(b)	(b)
West Virginia.....	45	12	12	17	40	48	(b)	(b)	(b)
Ohio.....	135	30	41	72	56	85	6	28	38
Indiana.....	111	42	46	51	32	42	8	50	38
Illinois.....	137	21	33	44	26	34	9	61	51
Michigan:									
Northern Peninsula.....	17	413	414	37	82	94	13	74	85
Southern Peninsula.....	103	71	88	37	82	94	13	74	85
Penninsula.....	90	66	78	28	42	51	5	136	162
Wisconsin.....	60	105	164	34	43	55	2	12	20
Minnesota.....	28	18	28	55	23	42	3	104	81
Iowa.....	6	9	12	12	8	20	2	5	16
North Dakota.....	2	35	40	9	31	52	(b)	(b)	(b)
South Dakota.....	10	7	17	29	24	34	(b)	(b)	(b)
Nebraska.....	30	39	46	16	19	19	3	20	22
Virginia.....	50	66	68	13	62	69	5	27	31
North Carolina.....	44	87	106	9	97	87	1	12	22
South Carolina.....	34	71	84	8	78	79	2	43	46
Georgia.....	6	58	57	2	54	93	1	26	64
Florida.....	27	18	24	23	24	42	4	18	41
Kentucky.....	80	33	40	12	23	33	3	22	32
Tennessee.....	34	49	53	8	46	33	3	87	85
Alabama.....	23	54	56	11	19	50	4	15	14
Mississippi.....	80	26	41	44	19	27	(b)	(b)	(b)
Missouri.....	38	42	51	17	25	60	(b)	(b)	(b)
Kansas.....	19	74	85	5	11	37	(b)	(b)	(b)
Oklahoma.....	18	75	86	3	30	55	(b)	(b)	(b)
Arkansas.....	2	16	19	3	33	33	1	120	119
Louisiana.....	29	12	14	8	16	22	1	28	40
Texas.....	32	50	52	15	12	20	1	23	24
Colorado.....	4	271	207	9	30	36	(b)	(b)	(b)
New Mexico.....	7	815	763	(b)	(b)	(b)	(b)	(b)	(b)
Arizona.....	27	51	55	(b)	(b)	(b)	(b)	(b)	(b)
Utah.....	5	55	59	(b)	(b)	(b)	(b)	(b)	(b)
Nevada.....	3	3	7	(b)	(b)	(b)	(b)	(b)	(b)
Wyoming.....	15	112	125	(b)	(b)	(b)	(b)	(b)	(b)
Montana.....	13	51	43	(b)	(b)	(b)	(b)	(b)	(b)
Idaho.....	13	31	33	(b)	(b)	(b)	(b)	(b)	(b)
Washington.....	3	50	113	(b)	(b)	(b)	(b)	(b)	(b)
Oregon.....	4	263	243	(b)	(b)	(b)	(b)	(b)	(b)
California.....									
Total United States...	2,336	56	67	790	44	54	111	79	87

(a) The rate of consumption used is the average for the three months of August, September and October, 1921.
(b) No data.

ESTIMATED TOTAL COMMERCIAL STOCKS OF BITUMINOUS COAL
IN THE UNITED STATES OCT. 1, 1916, TO NOV. 1, 1921 (a)

(In Net Tons)

Oct. 1, 1916.....	25,000,000 to 29,000,000.....	probably	27,000,000
Oct. 1, 1917.....	26,000,000 to 30,000,000.....	probably	28,100,000
July 15, 1918.....	38,000,000 to 42,000,000.....	probably	39,700,000
Oct. 1, 1918.....	58,000,000 to 60,000,000.....	probably	59,000,000
Day of the armistice.....	62,000,000 to 64,000,000.....	probably	63,000,000
Jan. 1, 1919.....	57,000,000 to 59,000,000.....	probably	57,900,000
April 1, 1919.....	38,000,000 to 42,000,000.....	probably	40,400,000
March 1, 1920.....	22,000,000 to 27,000,000.....	probably	a 24,000,000
June 1, 1920.....	18,000,000 to 23,000,000.....	probably	a 20,000,000
Jan. 1, 1921.....	42,000,000 to 48,000,000.....	probably	b 45,800,000
April 1, 1921.....	36,000,000 to 42,000,000.....	probably	b 39,500,000
Aug. 1, 1921.....	38,000,000 to 44,000,000.....	probably	b 41,100,000
Nov. 1, 1921.....	44,000,000 to 50,000,000.....	probably	b 47,400,000

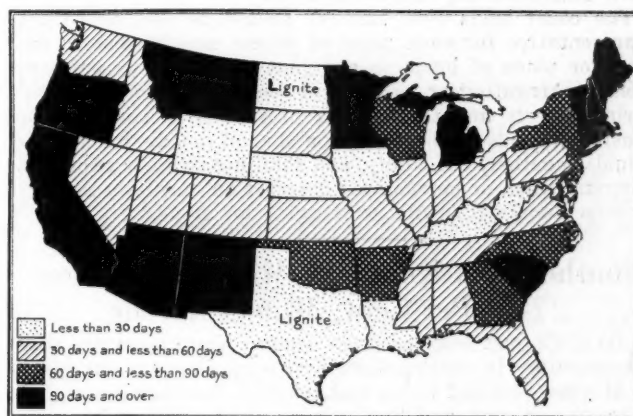
(a) Coal in transit not included. (b) Subject to revision.

DAYS' SUPPLY OF ANTHRACITE AND BITUMINOUS COAL IN
HANDS OF VARIOUS CLASSES OF CONSUMERS IN THE
UNITED STATES JULY 15, 1918, TO NOV. 1, 1921

(Figures represent number of days supply would last at current rate of consumption at time of stock-taking)

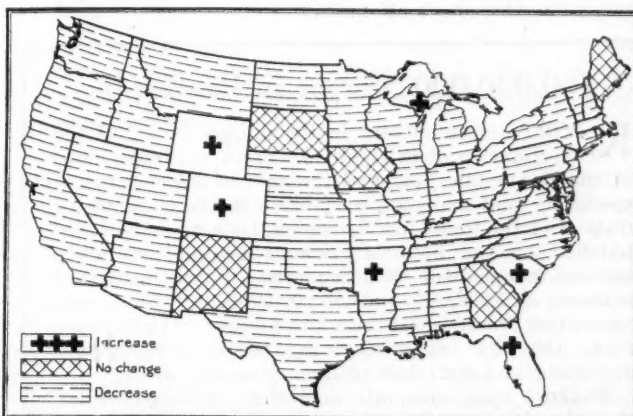
Class of Consumer	Bituminous			Anthracite			Total		
	July 15, 1918	Nov. 1, 1921	Aug. 1, 1921	July 15, 1918	Nov. 1, 1921	Aug. 1, 1921	July 15, 1918	Nov. 1, 1921	Aug. 1, 1921
Byproduct coke plants.....	28	35	32	23	a15	a8	29	28	31
Steel plants.....	27	45	42	35	a9	a11	42	38	46
Other industrials.....	48	71	65	47	27	24	64	47	56
Artificial gas plants.....	72	85	81	58	31	22	55	66	79
Electric utilities.....	39	49	49	48	21	22	44	48	44
Coal dealers, bituminous.....	15	37	39	25	13	10	30	26	42
Railroads.....	25	31	32	No data	a11	a10	24	24	No data
Total bituminous.....	31	45	42	31	18	15	a39	a36	a39
Coal dealers, anthracite.....	No data	No data	36	31	21	15	24	36	50

(a) Estimated from incomplete data. Subject to important revision.



DAYS' SUPPLY OF SOFT COAL ON HAND AT
INDUSTRIAL PLANTS ON NOV. 1, 1921

Reports from 2,330 industrial consumers other than steel and byproduct coke plants showed an average supply sufficient to last 67 days at the rate of consumption prevailing from Aug. 1 to Nov. 1, 1921. How the supply varied from state to state is shown in the diagram. The darker the shading, the heavier are the stocks. If business should revive and consumption increase, the stocks expressed in days' supply would be smaller.



HOW PRESENT STOCKS AT INDUSTRIAL PLANTS
COMPARE WITH THOSE ON JAN. 1, 1921

Changes in tonnage on hand at 2,061 identical industrial plants other than steel and byproduct coke plants are shown. The quantity held by industrials decreased in most states although, because of the reduced rate of consumption, the present stocks would last as long as those on Jan. 1. Increase in coal on Lake docks.

the country's reserve was increased from Aug. 1 to Nov. 1 this year. Electrical utilities increased their supply from 44 to 54 days and at the same time increased their rate of consumption over the summer months. This buying by the utilities for their reserves was not confined to any one section of the country but was general, few states reporting a falling off in the size of their stock piles.

Industries other than steel and coke increased their reserve from 56 to 67 days. New England industries now average four and a half months' supply and 17 concerns in the northern peninsula of Michigan have 414 days; Minnesota shows 164 days, and Wisconsin, 78 days. Figures for the Northwest are exclusive of coal on the docks. It is evident, therefore, that both New England and the Northwest have an abundance of bituminous coal.

Production of bituminous coal in August was 34,538,000 net tons; September, 35,127,000, and October, 43,733,000, a total of 113,398,000, of which approximately 6,300,000 went into storage. These figures indicate that the impetus given to production in October by the threatened railroad and coal miners' strikes account for the gain in reserves.

Supreme Court Upholds Barring of Pickets

IN A sweeping decision dissented from by only one member the U. S. Supreme Court ruled Dec. 5 that so-called peaceful picketing by labor unions is unlawful and subject to court injunction notwithstanding the supposed immunity given labor unions by the Clayton Act.

The court holds that strikers should be limited to one representative for each point of egress and ingress in the plant or place of business and that all others be enjoined from congregating or loitering at the plant or in the neighboring streets and that such representatives shall not be abusive, libelous or threatening and shall not approach individuals together, but singly, and shall not in their efforts at communication or persuasion "obstruct an unwilling listener by importunate following or dogging his steps."

Southeastern Kentucky Mines Cut Wages 27-30 Per Cent; Miners Accede

ADVICES just received from eastern Kentucky state that operators in southeastern Kentucky districts, including the Harlan, Straight Creek and Jellico fields, have cut wages 27 to 30 per cent, and that miners are so willing to work that they readily accepted the cuts. Large numbers of mines were closed down as a result of reductions in the Hazard and Elkhorn as well as West Virginia fields, which left the situation such that southeastern Kentucky was unable to meet competition.

While the union scale was being paid in many of the southeastern Kentucky mines the union was never officially recognized, and the operators were not paying the least attention to the check-off matter.

\$60,000,000 Merger in Panhandle

REPORTS were current in Pittsburgh Dec. 2 of the consolidation of thirty independent coal companies in the Panhandle field and the sale of 4,000 acres of operating coal and coke properties in the Greensburg district of the Connellsville region, both deals reported handled by the financial powers behind the newly merged independent steel concerns. It was said that between \$50,000,000 and \$60,000,000 worth of coal properties would enter into the merger, which would make the new corporation the second largest coal operating and distributing agency in the world.

Bankers were also informed that negotiations for the sale of vast coal acreage and coking plants by the Jamison Coal & Coke Co. to the Keystone Coal & Coke Co. were nearing completion. The property involved in the deal is five operations in the Greensburg basin with an annual production of 2,000,000 tons of coal and 700,000 tons of coke.

Federal Survey Shows Better Business

CONTINUED improvement in industrial and commercial conditions is shown by figures just published by the Department of Commerce in its monthly "Survey of Current Business." Greater output of iron and steel and of textile products is shown, while a widespread increase in building, stimulated to a large extent by the President's recent conference on unemployment, has made itself felt in lumber, cement, brick and related industries.

The department notes further declines in prices during October, but on a much smaller scale than earlier in the year. This relative stability of prices and the improved banking situation, as evidenced by increased reserves, smaller loans and lower interest rates, are considered favorable to further business improvement. The most serious drawback is stated to be the low price of agricultural products and the consequent decreased buying power of the farmers.

Retail prices on Nov. 1 showed no change, and wholesale prices declined slightly. Wholesale prices in Canada, the United Kingdom and France also declined during October, but continued inflation increased the price level in Germany and Italy.

Governor Sproul Appoints Commissioners To Administer Fowler Law

UNDER the act of May 27, 1921, Governor Sproul of Pennsylvania on Nov. 23 appointed James B. Smith, of Scranton; Philip Bevan, of Wilkes-Barre, and Thomas H. B. Lyon, of Mahanoy City, commissioners, under the Fowler Law for the administration of the fund to be formed by contributions of 2 per cent on the value of all coal mined by the anthracite companies operating subject to the provisions of that law.

James B. Smith will be chairman. The men named come, as will be noted, each from one of the three counties that have the largest output of anthracite. They will be paid \$8,000 a year and are empowered to name engineers, assistants and a clerical force.

Some Kansas Mine Workers Return to Mines

ACCORDING to the report of George L. Peck, Alexander Howat's successor as president of the United Mine Workers in the Kansas fields, more than half the mine workers have returned to work. This report was made Nov. 28 to the executive board of the union at Indianapolis. Mr. Peck stated that between 4,500 and 5,000 mine workers have returned to the mines, that 1,500 have left the state disgusted with the continued striking and factional strife and that 2,500 have been expelled for failing to go to work Nov. 25, as ordered.

Nearly All Anthracite Companies Officially Repudiate Fowler Act Within Time Set

NON-ACCEPTANCES of the Fowler Act, where not filed with the commission under that act before Sunday, Nov. 27, six months after the passage of the legislation, cannot thereafter be legally accepted. All those who did not file within the specified period are to be regarded as coming under the provisions of the act. Most, if not all, of the companies have filed these non-acceptances, but the commission operating under the Fowler Act is not yet in a position to declare what companies by negligence or intention have put themselves under its provisions, provided, of course, the law is found constitutional.

Five Colorado Coal Cos. Ask Wage Cut

FIVE LARGE coal companies in Huerfano County, Colorado, filed with the Colorado Industrial Commission Friday, Dec. 2, notices of a proposed 32½ per cent reduction in the wages of their employees. The reductions are proposed to become effective Jan. 1. Recent reduction by the Colorado Fuel & Iron Co. in the price of coal following wage reductions approximating 30 per cent "forced" the companies to take similar action, it was announced.

Commerce Commission Expected to Make Early Decision On Freight Rates; Hearing Begins Dec. 14

BY PAUL WOOTON
Washington Correspondent

DUE to the far-reaching economic effect of the uncertainty as to freight rates, it is expected that the Interstate Commerce Commission will reach its conclusions in much less than the average time given the consideration of an important case. Some traffic specialists are sanguine enough to predict that the opinion will be forthcoming by March 1. The length of time consumed in hearings will depend on the latitude allowed to representatives of industry. For instance, if the National Coal Association should present the entire case of the bituminous industry, only a few hours would be required, but if the representatives of the producers in each group are to be heard several days would be required for the story of coal alone. It is believed, however, that the hearings are likely to extend until February 15.

The commission established a record for quick action in handing down its opinion in the grain case six weeks after it was opened. This was the first time that an opinion in a case of moment had been reached in anything like so short a time. It indicates, however, that the commission is willing to be governed by the exigencies of the situation and to remove uncertainty at the earliest possible moment. Since the need for expedition is obviously greater than it was in the grain case, a decision by March 1 is a possibility. This case is much more intricate but it is believed that many of the points involved already have been determined.

That the announcement of the opening of a general hearing on rates has led to widespread belief that freight rates are to be reduced within the next few days is amply attested by the telegrams reaching Washington. Many consumers have telegraphed within the last few days to ascertain the approximate date of the reduction. The telegrams indicate that there has been some publication in the Middle West of information leading to the conclusion that a 12 per cent reduction is imminent. It is believed that this erroneous opinion is contributing to the steep sag in the demand for coal, although all agree that the principal cause was the artificial stimulation that came with the threatened strikes, resulting in an oversold market. If it had not been for this artificial stimulation of buying, it is believed that the bituminous production curve would have continued its gradual upward trend, but now to the business depression must be added the temporary depression caused by recent stocking up.

As this is written no decision has been reached by the operators as to the procedure in presenting their case at the rate hearing. The railroad relations committee of the National Coal Association is expected to assemble in Washington on Dec. 12, so as to have two full days for an exchange of views. It is certain that there will be a full presentation of the coal producers' view.

In announcing the hearing for Dec. 14, the Interstate Commerce Commission says that the purpose is to elicit facts and that at the close of the hearing opportunity will be afforded for argument, at which time questions of law as applied to the facts of record may be discussed. During the period Dec. 14 to 21, inclusive, it is expected that the railroads will put in their case, cross examination to be deferred until Jan. 9. Before the close of the hearing on Dec. 21 a schedule arranged according to commodities for the hearing on and after Jan. 9, 1922, will be announced. It is emphasized that "relationships between particular points under existing rates are not in issue," which means that differentials will not be discussed.

It is purposed to ascertain whether the present rates are reasonable in the aggregate either in the country as a whole or in the several territorial rate groups defined in Ex Parte 74, and whether the rates on specified commodities or descriptions of traffic are reasonable.

In the investigation of operating expenses the railroads will be asked to specify how fuel contracts and costs now current compare with those in effect on Aug. 31, 1920; when such contracts expire, and to what extent contract prices are conditioned on wage scales.

The commission suggests that "what readjustments, if any, following *Increased Rates, 1920*, have not been but should be effected?" is a matter that should be gone into thoroughly, and adds: "If rates are found to be unreasonable in the aggregate in the country as a whole, or in one or more territorial rate groups (a) should a general reduction in all rates be required, or (b) should readjustment be required in the rates on specified commodities or descriptions of traffic?"

"If rates are found to be reasonable in the aggregate, but unreasonable on specified commodities or descriptions of traffic, what readjustment should be required?" The way is open for a consideration of lower coal rates, but there is nothing in the statement by the commission to indicate that it will order one unless the roads are financially able to sustain the loss of revenue.

Coal Consumed by Railroads in September

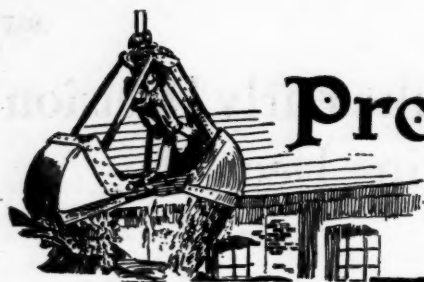
COAL consumed by Class 1 railroads in road service in September, as reported by the Bureau of Statistics of the Interstate Commerce Commission, was 8,110,448 net tons, compared with 10,088,752 in September, 1920. These figures include an equivalent coal tonnage for fuel oil consumed.

In the nine months ended with September these 164 roads consumed 83,814,005 tons of coal in 1921, compared with 90,728,143 tons in 1920, a decrease of nearly 7,000,000 tons, or 7.6 per cent. In the same periods the net revenue and non-revenue freight ton miles decreased from 334,457 million to 252,882 million, a drop of 24 per cent, and passenger business, expressed in passenger-train car miles, declined 6 per cent.

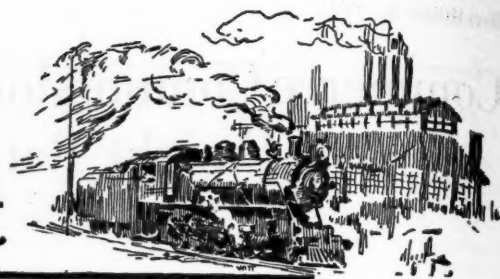
May Informally Adjust Issue of Coal Report

DEVELOPMENTS of the week indicate that a conclusion is likely to be reached that the matter of the weekly coal report hardly requires the attention of the President or of Cabinet officers. It is not improbable that the whole matter will be adjusted informally by Director Smith, of the Geological Survey; Director Steuart, of the Census, and Messrs. F. G. Tryon and F. R. Wadleigh, coal specialists of the Geological Survey and the Department of Commerce respectively.

THE COMMITTEE OF THE NATIONAL COAL ASSOCIATION which will co-operate with the Department of Commerce in efforts to stimulate foreign trade in coal is made up as follows: J. G. Bradley, president Elk River Coal & Lumber Co., Dundon, W. Va., chairman; A. M. Ogle, president Vandalia Coal Co., Terre Haute, Ind.; C. B. Bokus, president Clinchfield Coal Corporation, New York; E. C. Mahan, president Southern Coal & Coke Co., Knoxville, Tenn.; A. J. Maloney, vice-president Chicago, Wilmington & Franklin Coal Co., Chicago; H. N. Taylor, vice-president Central Coal & Coke Co., Kansas City, Mo.; T. H. Watkins, president Pennsylvania Coal & Coke Corporation, New York; T. W. Guthrie, president Hillman Coal & Coke Co., Pittsburgh; J. D. A. Morrow, vice-president National Coal Association, Washington. W. H. Cunningham, vice-president Court-right, Dimmick & Cunningham, Inc., New York, was named as secretary of the committee.



Production and the Market



Weekly Review

WRITING a review of the week's developments in the coal industry is like preparing an obituary notice of an erstwhile prominent citizen. Spot demand is practically non-existent, and what the future holds is uncertain and unknown.

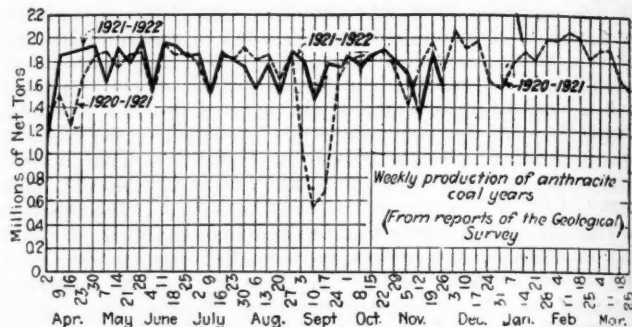
The proximity of the holiday period is held partly responsible for the sluggish market and this natural seasonal recession in the trade is accentuated by the unsatisfactory condition of business in general. The weather continues to flirt with the domestic branch of the coal business and general underselling is necessary to move industrial fuels. This combination has proved too strong for the current market and production continues to drop.

UNION MINES SHUT DOWN OR CUT PRICES

Field after field reports a preponderance of closed mines as prices recede. *Coal Age* Index of spot prices at the mines took another drop last week, from 86 to 84, a decline in four weeks of seven points, or about 8 per cent. The really significant feature in spot prices this week is that of eight declines; all but one were of union coal. This simply means that to meet non-union competition union operators are forced to lower prices or close their mines. Reduction in spot prices and in production result, as chronicled by the statistics for the week.

So much storage coal—it is estimated at 6,300,000 tons—was taken during October that there is no demand left. Contract coal is moved with difficulty and spot sales are scarce. Retail stocks are topheavy, which has naturally reduced domestic production. As a result, screenings and steam grades have risen from their distress position because of the relative scarcity, and quotations are at least stable. In the Midwest especially the position is now reversed, and the "no-bills" are of domestic coal, while the limited steam tonnage moves readily.

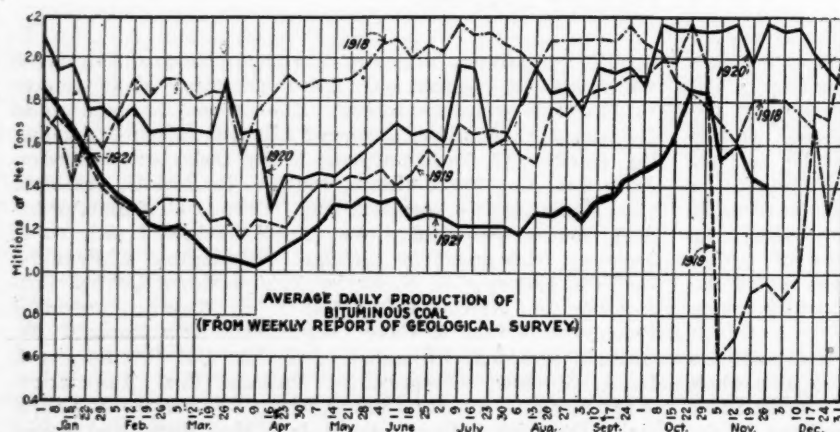
Coastwise markets are stagnant. Exporters received an unwelcome surprise last week when steamers laden with British coal for California and Honolulu put in at Hampton Roads for bunkers. Return freights to the British Isles made possible the transportation of English coal on practically a ballast basis, but nevertheless the continuance of this procedure is an unwelcome possibility in the minds of the American trade. Another discomfiting report is that Cuban houses are preparing to replace their stocks of American coal with British product, because of cheaper delivered prices.



Anthracite retail distribution has been retarded by the warm weather. As in bituminous, stocks are heavy and household purchasing is confined to small lots. With the approach to overproduction, some mine closings are reported and independent premiums are on the decline. Steam sizes have weakened further, and while the "companies" are holding to schedule or running to storage, independent quotations are nominal and there is considerable distress coal on the market.

BITUMINOUS

Production dropped to 7,083,000 net tons during the week ended Nov. 26, according to the Geological Survey. The decrease of 1,811,000 tons from the output of the previous week was mainly caused by Thanksgiving Day idleness, which affected the balance of the week. That the decline in

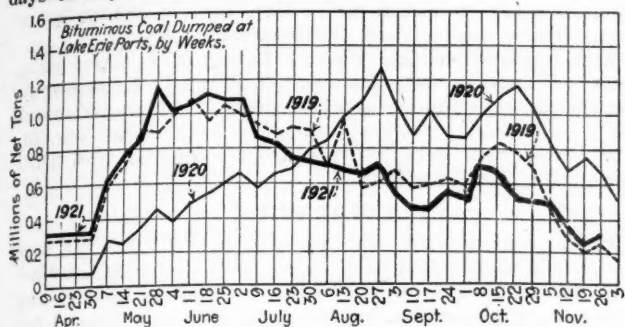


Estimates of Production (Net Tons)

BITUMINOUS COAL			
Week Ended:	1921	1920	
Nov. 12 (b).....	8,592,000	12,132,000	
Nov. 19 (b).....	8,894,000	11,693,000	
Nov. 26 (a).....	7,083,000	11,488,000	
Daily average.....	1,400,000	2,188,000	
Calendar year.....	372,106,000	495,530,000	
Daily average calendar year.....	1,339,000	1,773,000	
ANTHRACITE			
Nov. 12.....	1,373,000	1,770,000	
Nov. 19.....	1,910,000	1,993,000	
Nov. 26 (a).....	1,677,000	1,708,000	
Calendar year.....	80,790,000	79,824,000	
COKE			
Nov. 19.....	111,000	364,000	
Nov. 26 (a).....	108,000	367,000	
Calendar year.....	4,934,000	19,193,000	

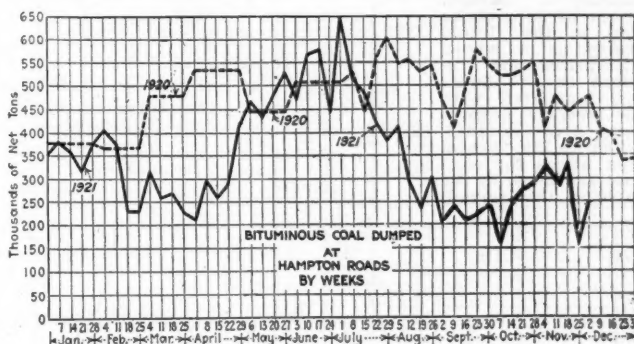
(a) Subject to revision. (b) Revised from last report

output was continued during the next week—Nov. 26-Dec. 3—is indicated by reports of loadings in the first two days, the total of which was smaller than on the corresponding days of any week since last July.



Calendar year production is 372,106,000 tons, which is behind any of the last five years, being 144,000,000 tons under the average of all years. That the low production does not presage a shortage is indicated by figures of coal stocks on hand, published elsewhere in this issue. These stocks on Nov. 1 were the heaviest since the Armistice and with the prevailing low rate of consumption represent an even larger number of days' requirements than existed at that time.

Lake shipments are ended except for a few cargoes of special fuels which are now being loaded. Dumpings for the week ended Nov. 27 were 346,705 net tons—335,949 tons cargo and 10,756 vessel fuel—as compared with 273,569 in the week previous. The season's dumpings to date are 22,972,280 tons, as compared with 23,152,263 tons last year.



Continued agitation of the freight rate question is holding buying to a hand-to-mouth basis. While lowered rates do not appear possible for a matter of months, the hope for relief from this source is acting against any fuel purchase except for imperative needs. The January in-

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Market Quoted	Nov. 7, 1921	Nov. 21, 1921	Nov. 28, 1921	Dec. 5, 1921†
Low-Volatile, Eastern				
Pocahontas lump.....	Columbus... \$4.85	\$4.35	\$4.35	\$3.50@ \$4.00
Pocahontas mine run.....	Columbus... 2.55	2.35	2.35	2.15@ 2.35
Pocahontas screenings.....	Columbus... 1.75	1.70	1.60	1.45@ 1.70
Pocahontas lump.....	Chicago... 4.75	4.35	4.00	3.75@ 4.00
Pocahontas mine run.....	Chicago... 3.15	2.65	2.35	2.00@ 2.50
Pocahontas screenings.....	Cincinnati... ..	..	..	\$3.00@ 3.15
*Smokeless mine run.....	Boston... 4.80	4.80	4.80	4.75@ 4.90
Clearfield mine run.....	Boston... 1.95	1.80	1.80	1.60@ 2.00
Cambria mine run.....	Boston... 2.45	2.35	2.35	2.10@ 2.60
Somerset mine run.....	Boston... 1.90	1.75	1.85	1.65@ 2.00
Pool 1 (Navy Standard)....	New York... 3.20	3.05	3.00	2.75@ 3.25
Pool 1 (Navy Standard)....	Philadelphia... 3.15	3.15	3.15	2.80@ 3.25
Pool 1 (Navy Standard)....	Baltimore... 2.65	2.70	2.60	2.35@ 2.50
Pool 9 (Super. Low Vol.)...	New York... 2.50	2.35	2.35	2.15@ 2.50
Pool 9 (Super. Low Vol.)...	Philadelphia... 2.45	2.45	2.35	2.25@ 2.50
Pool 9 (Super. Low Vol.)...	Baltimore... 2.35	2.40	2.40	2.00@ 2.15
Pool 10 (H. Gr. Low Vol.)...	New York... 2.15	2.05	2.05	2.00@ 2.15
Pool 10 (H. Gr. Low Vol.)...	Philadelphia... 2.15	2.15	2.10	2.00@ 2.10
Pool 10 (H. Gr. Low Vol.)...	Baltimore... 2.10	2.10	2.10	1.85
Pool 11 (Low Vol.).....	New York... 1.85	1.85	1.85	1.60@ 1.85
Pool 11 (Low Vol.).....	Philadelphia... 1.85	1.85	1.85	1.75@ 1.95
Pool 11 (Low Vol.).....	Baltimore... 1.85	2.00	2.05	1.75
High-Volatile, Eastern				
Pool 54-64 (Gas and St.)...	New York... 1.65	1.70	1.75	1.50@ 1.65
Pool 54-64 (Gas and St.)...	Philadelphia... 1.70	1.70	1.70	1.60@ 1.80
Pool 54-64 (Gas and St.)...	Baltimore... 1.65	1.65	1.70	1.50@ 1.75
Pittsburgh sc'd gas.....	Pittsburgh... 2.65	2.65	2.65	2.60@ 2.70
Pittsburgh mine run (St.)...	Pittsburgh... 2.15	2.15	2.15	2.10@ 2.20
Pittsburgh slack (Gas)....	Pittsburgh... 1.65	1.40	1.40	1.25@ 1.50
Kanawha lump.....	Columbus... 3.25	3.20	3.10	2.75@ 3.25
Kanawha mine run.....	Columbus... 2.05	1.85	1.85	1.80@ 2.00
Kanawha screenings.....	Columbus... 1.10	1.00	1.00	.90@ 1.10
Kanawha lump.....	Cincinnati... ..	..	..	2.75
Kanawha mine run.....	Cincinnati... ..	..	..	1.50@ 1.75
Kanawha screenings.....	Cincinnati... ..	..	..	.85@ 1.00
Hocking lump.....	Columbus... 3.25	3.15	3.20	3.00@ 3.25
Hocking mine run.....	Columbus... 2.10	2.00	2.00	1.90@ 2.00
Hocking screenings.....	Columbus... 1.10	0.95	0.95	1.10@ 1.25
Market Quoted	Nov. 7, 1921	Nov. 21, 1921	Nov. 28, 1921	Dec. 5, 1921†
Midwest				
Franklin, Ill. lump.....	Chicago... 3.65	3.75	3.65	3.50@ 4.05
Franklin, Ill. mine run....	Chicago... 2.90	2.85	2.75	2.50@ 3.00
Franklin, Ill. screenings...	Chicago... 1.60	1.60	1.85	1.50@ 2.00
Central, Ill. lump.....	Chicago... 3.50	3.35	3.35	3.00@ 3.75
Central, Ill. mine run....	Chicago... 2.50	2.50	2.35	2.00@ 2.50
Central, Ill. screenings...	Chicago... 1.85	1.35	1.25	1.60@ 1.75
Ind. 4th Vein lump.....	Chicago... 3.55	3.50	3.35	3.00@ 3.75
Ind. 4th Vein mine run....	Chicago... 2.90	2.75	2.75	2.60@ 2.90
Ind. 4th Vein screenings...	Chicago... 1.75	1.75	1.70	1.75@ 2.00
Ind. 5th Vein lump.....	Chicago... 2.70	2.80	2.80	2.60@ 3.00
Ind. 5th Vein mine run....	Chicago... 2.45	2.45	2.45	2.25@ 2.60
Ind. 5th Vein screenings...	Chicago... 1.75	1.50	1.35	1.40@ 1.60
Standard lump.....	St. Louis... 3.35	3.10	2.85	2.75@ 3.00
Standard mine run.....	St. Louis... 1.95	1.95	1.95	1.85@ 2.00
Standard screenings.....	St. Louis... .75	.95	.95	1.00@ 1.25
West Ky. lump.....	Louisville... 3.25	3.00	2.75	2.25@ 3.00
West Ky. mine run.....	Louisville... 2.20	1.90	1.90	1.50@ 2.00
West Ky. screenings.....	Louisville... .85	1.00	1.00	.45@ 1.50
South and Southwest				
Big Seam lump.....	Birmingham... 3.75	3.75	3.65	3.00@ 4.25
Big Seam mine run.....	Birmingham... 2.15	2.00	2.00	1.50@ 2.50
Big Seam (washed).....	Birmingham... 2.30	2.30	2.30	2.15@ 2.40
S. E. Ky. lump.....	Louisville... 3.75	3.60	3.10	3.00
S. E. Ky. mine run.....	Louisville... 2.30	2.20	2.10	2.00@ 2.10
S. E. Ky. screenings.....	Louisville... 1.30	1.15	1.10	.85@ 1.10
S. E. Ky. lump.....	Cincinnati... ..	..	..	3.00@ 3.25
S. E. Ky. mine run.....	Cincinnati... ..	..	..	1.50@ 2.00
S. E. Ky. screenings.....	Cincinnati... ..	..	..	.85
Kansas lump.....	Kansas City... 5.50	5.00	5.00	5.00
Kansas mine run.....	Kansas City... 4.25	4.25	4.25	4.00@ 4.25
Kansas screenings.....	Kansas City... 2.50	2.50	2.50	2.50

*Gross tons, f.o.b. vessel, Hampton Roads.

†Advances over previous week shown in heavy type, declines in italics.

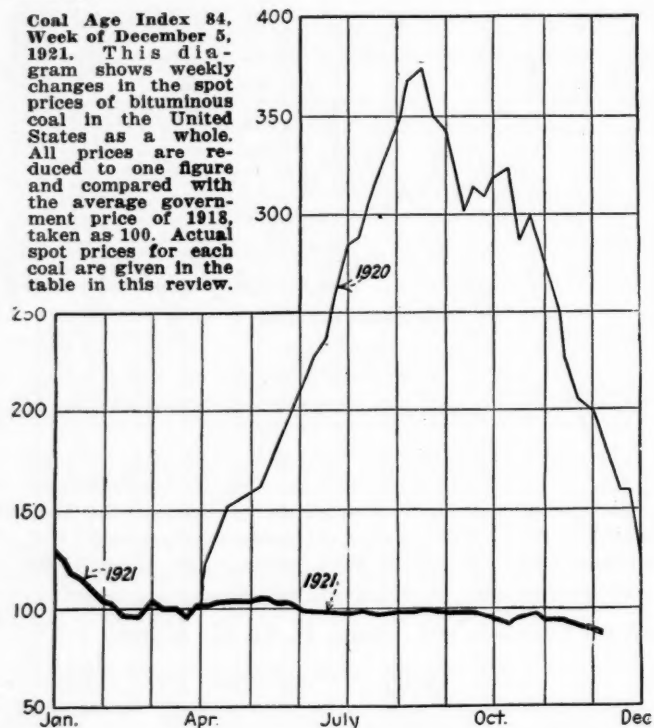
Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

Market Quoted	Freight Rates	Nov. 21, 1921	Nov. 28, 1921†	Dec. 5, 1921†
Independent				
Broken.....	New York... \$2.61		\$7.60@ \$7.75	\$7.60@ \$7.75
Broken.....	Philadelphia... 2.66	\$7.60@ \$8.20	7.75@ 7.85	7.75@ 7.85
Exg.....	New York... 2.61	8.00@ 8.25	7.60@ 7.75	7.50@ 8.00
Exg.....	Philadelphia... 2.66	8.10@ 8.35	7.75@ 7.85	7.75@ 8.00
Exg.....	Chicago... 5.63	8.00*	7.15*	8.00*
Stove.....	New York... 2.61	8.75@ 9.25	7.90@ 8.10	8.25@ 8.75
Stove.....	Philadelphia... 2.66	8.75@ 9.00	8.00@ 8.35	8.50@ 9.00
Stove.....	Chicago... 5.63	8.50*	7.40*	8.50*
Chestnut.....	New York... 2.61	8.75@ 9.25	7.90@ 8.10	8.25@ 8.75
Chestnut.....	Philadelphia... 2.66	8.50@ 9.00	8.05@ 8.25	8.50@ 9.00
Chestnut.....	Chicago... 5.63	8.25*	7.40*	8.25*
Pea.....	New York... 2.47	5.50@ 5.75	6.05@ 6.45	4.75@ 6.00
Pea.....	Philadelphia... 2.38	5.00@ 5.50	6.15@ 6.25	4.75@ 5.00
Pea.....	Chicago... 5.63	6.60*	5.80*	6.10*
Buckwheat No. 1.....	New York... 2.47	2.50@ 3.00	3.50	2.50@ 2.75
Buckwheat No. 1.....	Philadelphia... 2.38	2.75@ 3.25	3.50	2.50@ 3.00
Rice.....	New York... 2.47	1.75@ 2.40	2.50	1.50@ 2.00
Barley.....	Philadelphia... 2.38	1.75@ 2.25	2.50	1.75@ 2.00
Barley.....	New York... 2.47	1.00@ 1.25	1.50	1.00@ 1.25
Barley.....	Philadelphia... 2.38	1.00@ 1.50	1.50	1.25@ 1.50
Birdseye.....	New York... 2.47		2.50	2.50

†Advances over previous week shown in heavy type, declines in italics.

*Net tons, f. o. b. mines.

ventory period and the elimination of the war tax on shipments, effective at that time, also are factors in delaying trading.



It is probable that the check-off controversy will now drag on until spring. Any decision adversely affecting the union would be productive of an appeal to the Supreme

Court, and the question would thus be carried over until the time when the new wage scale is taken under advisement.

Tonnage is again accumulating at Hampton Roads. Dumpings for the week ended Dec. 1 were 223,888 gross tons. High-volatiles show the greatest depression.

New England business shows a falling off in water-borne coals. Coastwise agencies are about ready to throw up the sponge until demand again appears. The all-rail movement continued to decline during the week ended Nov. 26, when 2,928 cars were forwarded, as compared with 3,022 during the week previous.

ANTHRACITE

Production of hard coal dropped to 1,677,000 net tons during the week ended Nov. 26, as compared with 1,910,000 tons the week before. Observance of Thanksgiving Day was mainly responsible for the drop, although demand has slipped to such an extent that some mines are closing.

The domestic market is weaker following the warm weather, and independent quotations have softened 50c. to 75c. and in some cases even lower. Steam sizes are heavier than ever and there is an increasing volume of distress tonnage on track.

Lake movement is in a seasonal windup. Dumpings for the week ended Nov. 30 were 53,500 net tons, as compared with 85,600 the week previous. There was a slight improvement in New England all-rail shipments during the week ended Nov. 26, when 3,184 cars were forwarded.

COKE

Beehive coke production during Thanksgiving week declined 3,000 tons to 108,000. The continued absence of demand has caused an even softer market and prices are only nominal; spot furnace, \$3@\$.15, and foundry, \$4@\$.45. There is every reason to believe that the December consumption of coke will be less than that of November and coke markets are anticipating this recession.

Foreign Market And Export News

Coal Paragraphs from Foreign Lands

GERMANY—An increase in coal prices, of 132 marks a ton, was recently announced. A ton of coal, the pre-war price of which was 15@18 marks now costs, inclusive of the coal duties, 500 @600 marks. The Coal Tax Committee of the provisional Imperial Economic Council, after discussing the draft of a bill relating to changes in the coal tax law, decided to recommend that the tax be raised from 20 to 30 per cent; not to 40 per cent as had been proposed. The committee agreed with the policy of differentiation in the application of the tax according to the mines and the quality of the coal produced.

The production of coal in the Ruhr region during the week ended Nov. 21 was 1,574,000 metric tons, as compared with 1,835,000 during the week previous, according to a cable to *Coal Age*.

BELGIUM—The most notable feature of the market is the predilection which is being shown by consumers for classified coals, unscreened varieties being completely neglected, according to the *Colliery Guardian*. This may prove to be the prelude of a revival in demand, and it may also lead to increased prices for graded coals.

There is still great activity in the household section and uneasiness in the industrial department. An average

concession of 20 fr. is made in industrial grades.

SWEDEN—Imports of coal at Stockholm during October were 39,600 tons while coke totaled 8,400 tons. Arrivals during the week ended Nov. 12 were 12,800 tons, of which 10,950 tons of coal and 1,450 tons of coke came from the United Kingdom. The total imports were about 3,000 tons less than in the preceding week.

AUSTRALIA—Exports of coal from Newcastle, during October, 1921, were 285,000 tons.

ITALY—Prices for coal supplied by the Italian State Railways to private industries range from 2,100 lire per ton for Westphalian gas and bunker to 2,400 lire for Silesian gas and bunker coal and 2,600 lire for furnace coal from both fields.

The coal prices, which since June last had again been slowly reduced, are now firm and show even a slight increase.

Cardiff steam firsts are quoted 39s. 3d. on the Genoa market, according to a cable to *Coal Age*.

CHINA—Annual coal production and consumption for all purposes is approximately 23,000,000 net tons, according to *Commerce Reports*. Exports of 1,500,000 tons are practically equaled by imports, North China exporting and South China importing coal. Industrial coal is practically all produced from a limited number of modern mines, domestic needs being supplied from mines worked by native methods.

Amount and Value of British Coal Exports, October and First Ten Months of 1913, 1920 and 1921

	Quantity (Tons)			Value		
	1913	1920	1921	1913	1920	1921
Anthracite.....	281,443	151,948	233,405	£233,702	£582,897	£569,399
Steam.....	4,952,643	1,058,047	2,540,761	3,468,633	4,705,545	3,381,101
Gas.....	1,026,497	164,119	472,082	653,604	645,631	708,125
Household.....	159,373	3,878	44,790	106,186	11,099	64,873
Other sorts.....	319,517	39,506	114,934	203,120	163,325	127,954
Total.....	6,739,473	1,417,498	3,405,972	£4,665,245	£6,108,497	£4,851,452

	Quantity			Value		
	1913	1920	1921	1913	1920	1921
Anthracite.....	2,470,934	1,402,172	1,008,633	£1,977,034	£4,442,561	£2,655,148
Steam.....	44,708,116	17,273,583	12,426,178	31,574,293	70,256,611	23,537,189
Gas.....	9,610,209	1,751,241	2,611,065	5,913,125	6,961,489	5,309,648
Household.....	1,495,206	55,918	134,622	980,119	152,415	248,307
Other sorts.....	2,972,796	786,139	577,028	1,852,830	2,787,897	957,319
Total.....	61,257,261	21,269,053	16,757,526	£42,297,401	£84,600,973	£32,707,611

British Invade West Coast Coal Markets; Havana Business Also Slipping

Hampton Roads factors were subjected to two distinct shocks last week, the first being when the British steamer Ethelstan put into port for bunkers, en route to San Diego, Cal., from Cardiff, with a part cargo of 4,000 tons of coal, and the other following a few days later when the British steamer Baron Jedburgh stopped for bunkers en route to Honolulu. She brought 6,000 tons of Welsh coal for the Hawaiian Islands.

The Ethelstan's coal is being carried to the West Coast as an experiment. The freight on that cargo was \$1 per ton, which is, of course, far below cost, but the steamer has a return cargo of lumber awaiting her on the Pacific Coast.

The Baron Jedburgh gets \$4 per ton freight on her coal, but she has a cargo for return in Hawaii, which offsets any loss incurred in the coal freight.

If these cargoes prove successful, they will be the forerunners of a continuous shipment of British coal to the Pacific, the captains of the pioneer British coal carriers said. Coal is being sold in Great Britain at figures considerably under the American prices, and with the additional \$1 per ton freight the coal to California can still be sold at a profit considerably under the American market as it exists today.

Hampton Roads coal shippers have been somewhat disturbed by these developments. They do not believe they can compete in such a market as long as freight rates, and other costs incident to the movement of coal from the mines, are at their present high level.

American exporters received another jolt last week. It was learned that orders have been sent to Havana to clean up all American coal on the docks and to fill up with Cardiff coal, which, the reports assert, can be delivered at Havana about \$2 a ton cheaper than American coal.

The office of Mr. Rios, export manager for Berwind-White, advised *Coal Age* on Tuesday of this week that this company has not and will not replace American coal with the British product at its Havana depot.

French Mine Costs Are Prohibitive

High costs of production at French mines has permitted British coal to be sold in the Pas de Calais, the heart of French coal mining. French coal owners are not in a position to lower their prices and have decided to postpone the question of reducing wages until January. This being so, a cut in prices can only

come from lower inland tariffs or from the average price of German and French fuel combined being lower, as a result of recent negotiations with Germany.

Although promises have been made, it is unlikely that salvation will come from transport. Therefore if the British mines can continue to offer such good conditions their progress in the heart of France is for a time assured. The French owners, however, hope that before long the Government's subsidy will cease. Then the home product will once more become the cheaper.

British Output Increases Slowly

British production is slowly increasing, according to figures cabled to *Coal Age*. During the week ended Nov. 19 the output was 4,646,000 gross tons as compared with 4,373,000 Nov. 12 and 4,182,000 Nov. 5.

The export trade is gaining ground. Newcastle business reported covers December delivery of steam coal at 25s.; first quarter, 26s. 6d.; for the year, 17s. 6d. South America has placed an order for 20,000 tons best Monmouthshire at 23s. 6d. A fair amount of business is passing with Italy and the Mediterranean.

Mine congestion still continues, however, and export facilities have apparently reached the limit under the present two-shift system.

Hampton Roads Depression Increases

Business was exceedingly dull last week, with accumulations at Tidewater increasing.

The movement to foreign countries showed another marked decline. Coastwise business was also little in evidence, with bunkers holding their own on contract.

Pool 1, was being offered freely at \$4.80, and in some isolated cases somewhat under this figure. Cut rates, however, did not appear to stimulate buying to any great extent. High-volatile coals show the biggest loss in movement, and the supply of these is being reduced to a minimum.

Dumpings for November were 985,000 gross tons, the only time, except September, in which they have fallen below the 1,000,000-mark since last winter. The C. & O. Piers showed the biggest loss, dumping only 160,000 tons last month as against 550,000 tons in November, 1920. The Virginian Piers lost only 100,000 tons by comparison,

while the Norfolk & Western dumpings showed a decline of some 225,000 tons from the corresponding month of last year.

Export Clearances, Week Ended

Dec. 1, 1921

FROM HAMPTON ROADS

FOR AFRICA:	Tonnage
Br. SS. Hartfield, for Dakar.....	6,504
FOR ARGENTINE:	
Br. SS. Avonmede.....	5,821
FOR CANADA:	
Amer. Schr. Lincoln, for St. Johns, N. B.....	545
FOR CUBA:	
Amer. Schr. Kingsway, for Cayo Frances.....	1,892
Br. SS. Finchley, for Havana.....	4,547
FOR MEXICO:	
Amer. Schr. James E. Coburn, for Vera Cruz.....	1,077

FROM PHILADELPHIA

FOR ATLANTIC ISLANDS:	
SS. Ozama, for San Juan.....	
FOR BRAZIL:	
SS. Orinoco, for Rio de Janeiro....	3,059

Hampton Roads Pier Situation

— Week Ended —
Nov. 24 Dec. 1

N. & W. Piers, Lamberts Point:		
Cars on hand.....	1,905	1,399
Tons on hand.....	97,820	72,363
Tons dumped.....	75,829	102,958
Tonnage waiting.....	2,200	9,000
Virginian Ry. Piers, Sewalls Point:		
Cars on hand.....	1,511	1,503
Tons on hand.....	75,550	75,150
Tons dumped.....	45,512	84,614
Tonnage waiting.....	11,500	9,046
C. & O. Piers, Newport News:		
Cars on hand.....	1,466	1,571
Tons on hand.....	73,300	78,000
Tons dumped.....	39,537	36,316
Tonnage waiting.....	1,450	925

Pier and Bunker Prices, Gross Tons

(Foreign Bunker Quotations by Cable to Coal Age)

PIERS	Nov. 26	Dec. 3†
Pool 9 New York....	\$5.60@5.75	\$5.40@5.60
Pool 10, New York....	5.40@5.60	5.25@5.35
Pool 9, Philadelphia..	5.50@5.80	5.50@5.75
Pool 10, Philadelphia..	5.50@5.65	5.25@5.60
Pool 71, Philadelphia..	6.00	5.90@6.00
Pool 1, Hamp. Rds....	4.75@4.95	4.80
Pools 5-6-7 Hamp. Rds	4.25	4.25@4.50
Pool 2, Hamp. Rds....	4.65	4.65
BUNKERS		
Pool 9, New York....	\$5.95@6.10	5.70@5.90
Pool 10, New York....	5.80@5.90	5.55@5.65
Pool 9, Philadelphia..	6.00	6.00
Pool 10, Philadelphia..	5.75@5.90	5.75@5.85
Pool 1, Hamp. Rds....	5.00@5.10	4.95
Pool 2, Hamp. Rds....	4.75	4.80
Welsh, Gibraltar.....	45s. f.o.b.	45s. f.o.b.
Welsh, Rio de Janeiro.	65s. f.o.b.	65s. f.o.b.
Welsh, Lisbon.....	52s. f.o.b.	52s. f.o.b.
Welsh, La Plata.....	60s. f.o.b.	60s. f.o.b.
Welsh, Marseilles....	125 fr. f.o.b.	125 fr. f.o.b.
Welsh, Genoa.....	45s. t.i.b.	45s. t.i.b.
Welsh, Madeira.....	45s. f.a.s.	45s. f.a.s.
Welsh, Teneriffe.....	45s. f.a.s.	45s. f.a.s.
Welsh, Malta.....	47s. 6d. f.o.b.	47s. 6d. f.o.b.
Welsh, St. Michaels..	60s. t.i.b.	60s. t.i.b.
Welsh, Las Palmas....	45s. f.a.s.	45s. f.a.s.
Belgian, Antwerp....	40s. f.o.b.	40s. f.o.b.
Alexandria.....	49s. f.o.b.	49s. f.o.b.
Bombay.....	35 rupees	35 rupees
Capetown.....	42s. 9d.	42s. 6d.

C.I.F. Prices, American Coal

(In Gross Tons)

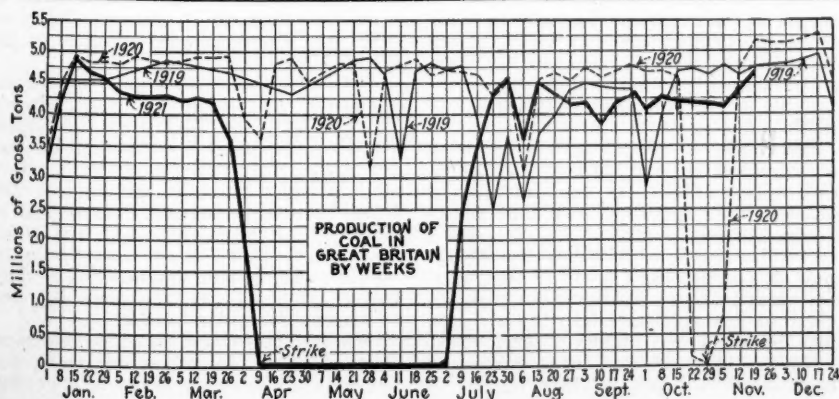
	Nov. 26	Dec. 3†
	Low High Vol. Vol.	Low High Vol. Vol.
French Atlantic.....	\$8.65 \$8.85	\$8.60 \$8.85
West Italy.....	8.65 8.85	8.60 8.85
The Plate.....	9.00 8.80	8.75 9.00
Havana.....	6.95 6.70	6.70 6.30

These quotations are purely nominal and as far as can be learned, no business is being done in these markets.

Current Quotations British Coal f.o.b. Port, Gross Tons

	Nov. 26	Dec. 3†
Cardiff		
Admiralty, Large....	25s. 9d.	25s. 6d. @ 26s.
Steam, Smalls.....	19s.	18s. @ 18s. 6d.
Newcastle:		
Best Steams.....	23s. 6d.	25s.
Best Gas.....	23s.	22s. @ 22s. 6d.
Best Bunkers.....	21s. 9d.	21s. 6d. @ 22s.

† Advance over previous week shown in heavy type, declines in italics.



Reports From the Market Centers

New England

BOSTON

Receipts Steadily Diminish—Accumulations at Hampton Roads—Retail Price Again Reduced—Anthracite Slows Up.

Bituminous—Current impressions of the market here are amply confirmed by figures showing the steadily diminishing receipts of steam coal. All-rail tonnages have varied little from week to week since Sept. 1, but by water, especially from Hampton Roads, there has lately been a marked falling off that can easily be attributed to a lack of buying power throughout the territory. The business of 1921 is practically completed, and were there even a semblance of possible demand in January all hands would gladly forget the year just closing and square away for a new start.

One has but to visit the different plants in most lines of industry to get a vivid impression of general dullness, and there is small reason for wonder that the steam trade is ragged in the extreme.

Certain low prices have been rumored, but they are hard to verify. More than likely the quotations made were on Pocahontas slack which has been offering in cargo lots on the basis of about \$1 flat at the mines per net ton. So dull is the market, however, that consumers seem quite indifferent whether it is slack or mine run that is quoted; they say they would not be interested in either.

Some of the coastwise agencies normally doing a considerable business in this market have about thrown up the sponge for the present and have suggested to their operators that the mines suspend until the surplus coal can be worked off. If this be the situation with operations that have been producing for several months with a fair degree of regularity at prices around \$2 per gross ton at the tippie, what can be the straits of Pennsylvania operators whose costs under existing wage scales, mount well toward \$3 when they are not higher?

Effective Dec. 1 Boston retail dealers reduced the local delivered price per net ton on sidewalks to \$8.75, the last previous figure having been \$9.25. This was to be expected when certain smokeless interests at various dates since Oct. 1 have modified materially the contract bases established early in the season.

The railroads who purchased much of their requirements early are being required by operators to take their quotas, and were it not for this tonnage the all-rail movement would be about the lightest ever for this time of year.

Anthracite—The continued mild weather is having its effect upon the domestic sizes. Egg is a drug on the market. Independents having been offering this size at a figure close to \$7, or nearly a dollar less than the company basis. Most of the regular shippers have orders in hand for what stove and chestnut can be produced in the

near future, but unless the weather shows a reversal soon the balance of the winter may show only light trading.

The last cargoes are going forward to the Penobscot and Kennebec rivers, the aggregate shipments being somewhat larger than in 1920, although that year a considerable tonnage went to Tidewater points all-rail. The state of supply has been relatively much easier this season and the all-rail tariff is too high to admit rail deliveries except in some real emergency.

Tidewater—East

NEW YORK

Anthracite Domestic Market Slipping—Independent Quotations Decline—Steam Coals Weak—Bituminous Demand Quiet—Quotations Easier.

Anthracite—The market appears to be slipping. Demand for stove and chestnut, which has been strong, shows signs of easing and the premiums for the independent product are not as high as they were a few weeks back. Egg is becoming longer and is being stocked by some producers.

Operators are having a hard time to move their product and unless weather conditions become more stable it is possible there will be a curtailment in mining. More coal is being produced than the market can readily absorb. Demand from the North and West has, however, been such as to take considerable tonnage of the various domestic coals but those markets are becoming fairly well supplied and it is expected that other means of disposal will have to be found shortly.

Retail yards are filled to overflowing and dealers must find an outlet before being able to take in heavy tonnages. Many are restricting their buying to actual needs until after the New Year begins, as they will then be able to save the three per cent war tax.

Steam coals are weak. There is considerable distress coals in the harbor which is being moved at extremely low figures. Quotations on fresh mined coals are low.

Bituminous—Conditions are such that comparatively little spot coal is being moved. Few houses are doing their normal business and operators are not forcing tonnage on consumers. In some offices quotations are not being given unless a prospective customer appears to be in need of fuel, and in many instances it is said that the consumer did the quoting.

There was a report last week of a sale of upward of 1,000 tons of Lancashire high-volatile coal brought here as ballast. This together with the receipt of considerable Southern coal has had a strong tendency to restrict the movement of the ordinary fuels in this market. Much of the Southern tonnage received is being placed here at a figure close to \$6, which means a price of \$5 at the loading ports. A large portion of these coals shipped to this harbor is

said to be consigned to a New Jersey corporation while local public utility corporations are using large quantities.

Industrial consumers seem to have stocks sufficient to carry them over the beginning of the New Year and are not willing to add to them any more than necessary because of the showing it will make in their inventory. The elimination of the war tax is also being taken into consideration by buyers.

There are plenty of light bottoms here and owners are beginning to complain of the scarcity of offers.

Odd lots of Pool 9 were quoted around \$2 at the mines and Pool 10 at around \$1.60, although the general trend was somewhat higher. Pool 14 was quoted \$5 and Pool 15, which is shipped to Amboy, was quoted at a similar figure.

PHILADELPHIA

Anthracite Displays More Weakness—Yards Have Capacity Stocks—Retail Prices Shaded—Bituminous Without Change—Railroads Curtail Buying.

Anthracite—With retail demand almost at a standstill, the trade is experiencing one of the most unusual let-downs ever known for this time of the year. The average dealer is not putting out as much coal as he did in some of the summer months, and with mild weather continuing there is no telling what the outcome will be. Some of the independent operators have already been compelled to curtail working time, and with the amount of coal now backed up at the mines the immediate outlook is not at all promising.

Independent shippers are having difficulty, as the demand has centered on nut and even many dealers have all they want of this, and have shut off orders with all shippers on every size. It is quite common to hear of shippers having egg and pea standing on demurrage at the mines. Naturally some cutting of prices has been heard of. However, there has been no general price shading as it was quickly seen that the dealers would not take coal in at any price as they were well filled.

Retail prices are still very weak, and only the larger retailers make any semblance of insisting upon \$14.50 for stove and nut and \$11.25 for pea. The average price is \$14 for the former, while pea has been sold as low as \$10.25, with most sales around \$10.75.

Steam sizes are heavier than ever and extraordinary methods have been made to move buckwheat. Practically all independent companies would be glad to take \$3 for buckwheat, and \$2.50 is reported as common.

Bituminous—Coal does not move in increased volume, and the immediate future points toward no particular improvement. There are reports of better industrial conditions, particularly in building trade lines, yet this improvement is by no means reflected in the bituminous trade.

Recently there seems to be an inclination on the part of the railroads to call for less fuel and this comes particularly hard to some operations, for with a fair railroad order, together with a light commercial tonnage, they have been able to make some kind of showing. Producers feel that if a bad spell of weather should ensue, industry would suffer by the confiscation of shipments en route, as is always the case in times of sudden stress.

We report prices about on the same level as for the preceding week, but there is no denying there is a general

softness noticeable. It is only the more reliable houses that are able to bolster up the situation by absolutely holding out for nothing lower than current market quotations, feeling that should the market break to a lower point it would spell disaster to many weaker interests.

BUFFALO

Market Grows Duller—Conditions Are Demoralizing — Anthracite Trade Affected by Unseasonable Weather.

Bituminous—The local trade has not been so dull since the flurry of August and September last year. It is not believed that the consumer will begin to buy at all actively again until about the middle of January, when he begins to fortify himself against the April suspension and not even then unless his present supplies run down considerably before that time.

The weather is conspiring to make all coal move slowly. There is still coal on track at various terminal points that was mined to meet a strike of some weeks ago that never occurred.

The state of the bituminous industry is bad in more than the mere matter of lack of demand. Miners' wages vary a matter of nearly a dollar a ton and conditions are doing what they can to demoralize the whole trade. Not much can be done about this until the new scale is adopted in April. Everybody dreads this time, even when it is so much needed to straighten the situation out.

Anthracite — Beginning December with the mercury at 55 deg. is not promising much in this trade. The consumer is not obliged to worry much about his supplies. Not in many years has the demand been so light.

The natural gas supply is light or a good many families would depend on it entirely and the stoves and grates are made to answer for furnace heating in many houses that would ordinarily have to use a furnace regularly.

Lake—Shipments have about stopped, before there is any sign of freezing-up weather and while steamers are eager for cargoes. They are still getting a good lot of wheat to bring down and do not like to go up light at this time of the year. For the week ended Nov. 30, the clearances were 53,500 tons, of which 37,500 cleared for Milwaukee, 10,000 for Fort William and 6,000 for Duluth.

Coke—The trade does not improve, although some of the furnace companies are preparing to increase their activity considerably. As a rule the local byproduct ovens are prepared to take care of any added demand. Quotations continue at \$4.15 for 72-hr. Connellsville foundry, \$3.15 for 48-hr. furnace and \$2.75 for stock.

BALTIMORE

Soft Coal Market Undoubtedly Hits Bottom—Industrial Demand Low—Anthracite Consumption Continues Below Normal—State's Case Against Dealers in Partial Collapse.

Bituminous—So far as both demand and prices are concerned trading has reached rock-bottom. With the best grades of both steam and gas now on the market with a high range of around \$2.25, and excellent coals securable at \$2@2.15, it cannot be figured that any further cut can come in view of actual production costs.

For the most part, coal men are con-

vinced that the business of the country is being held in check by the uncertainty of the freight rate situation and the high rates in most cases. There are quite a few letters in this territory, for instance, from cement manufacturers of eastern Pennsylvania who state that they are waiting for a re-adjustment of freight rates. In that section the freight rate is far in excess of the original cost at mines. In this section also the demand from all classes of manufacturing is far below normal and the habit of sacrificing coal by both mine and jobbing interests continues to grow.

The effect of extremely keen competition is shown in the prices at which bunker coals have been sold during the past week. With several very active bidders, the Shipping Board was able to land coal for its vessels as low as \$4.55 a gross ton, at piers before trimming. A local steamship company contracted for December delivery at \$4.70. While some of the sales are still up around \$5 the majority are lower.

Anthracite—The situation continues most unsatisfactory. There is little buying despite the fact that many persons have insufficient coal in their cellars to carry them over even a mild winter. The general tightness of money and lack of credit is playing a decided part in this situation.

A partial collapse of the state's sweeping charges against coal men took place in the Criminal Court of Baltimore last week when Judge Duffy ruled on demurrers to the indictment. Several of the main contentions of the state, relating to alleged price fixing, were upset by the ruling and while the trial is likely to continue on the ground that the dealers engaged in a combination to create a monopoly, it is admitted by the state's attorney that "the action of the court puts the state's attorney in a position where it will be more difficult to meet the requirements as to proof." The whole situation, as a matter of fact, seems to point to a final collapse of the case of the state on the charge of illegal price fixing.

Northwest

MINNEAPOLIS

Indifferent Demand—Buying Only for Immediate Use — Market Steadier — Winter Temperatures Needed.

The weather continues to flirt with the coal business. There will be a few days which suggest the need of stocking with fuel, only to be followed by melting days and a lapse of orders. Those enthusiastic prophets who foresaw naught but an old-fashioned cold winter and proclaimed the need of ample supplies to guard against freezing, have so far little to support their predictions.

The attitude of all buyers continues unchanged. Buying is done when the need for fuel is imperative, but not much sooner. Consumers, either domestic or steam, will not take hold until supplies are close to the vanishing point. Retail dealers are similarly inclined, as far as they dare be, and are not stocking beyond current needs.

Despite all the argument which has been used during the past six months to urge early buying, their position is well supported. It is the same in all

lines of merchandise. Merchants are buying small lots and often, hoping ever for better prices, and are at least confining their money invested in merchandise to lesser totals.

The logic is equally good in the coal business. It is true that it would be much easier for the producers and for the transportation companies if the coal tonnage could be handled in large orders with easy distribution loads at regular intervals. But some of them do not seem to have mastered the rudimentary fact that much of the time the markets do not exist solely for the ease and comfort of those two important factors. It is the buyer's will and pleasure which usually dominates. There are times when the seller has the commanding say, and the buyer is still railing at the results therefrom.

So far as all indications point, there will be little likelihood of anything more than moderate buying during the coming few weeks, unless below-zero weather stimulates the market. Anything like moderate weather will simply mean moderate buying, with probably more coal moving than seems to be the case.

The local market has steadied under the influence of cold weather and snow, but is only moderately stable at best. There is keen rivalry for business, and price cutting continues to be indulged in as a means of landing business, despite a little more support to the market.

MILWAUKEE

Mild Weather Prolongs Depression—Docks Heavily Loaded—Prices Held Steadily.

In the absence of fuel consuming weather, the market continues dull and depressed. Deliveries in the city are at a low ebb, and the outward movement by rail is about as slow.

The recent flurry of cold and snow was followed by mild, spring-like days, which make coal men fear a repetition of last year's iceless winter. Prices are fully maintained, however. Receiving yards are loaded up with coal, and surplus stock will be held afloat in steamers which are still arriving.

Receipts for the season thus far aggregate 950,972 tons of anthracite, and 2,579,502 tons of soft coal, against 805,186 tons of the former, and 2,765,372 tons of the latter during the same period last year.

DULUTH

Demand Quiets with Warm Spell — Prices Are Cut—Cargo Receipts End —Docks Heavily Stocked.

Again last week the weather man was the controlling factor in the coal market, and a few days of unusually mild weather, following a cold snap, influenced not only the general public but the dealers as well, to buy sparingly. The coal trade seems to be as much in the doldrums as it was last summer, with outgoing shipments few and far between.

Together with the slump has come a drop in price. Youghiogheny and Hocking lump are down to \$6.25 from a list price of \$7, and run of pile has dropped 50c. from a list of \$6.25. Screenings are holding firm at \$4, with only damaged lots being quoted at off-prices. The excess of screenings has now been absorbed.

Small-lot buying, which seems to

prevail among country dealers, is not only brought on by the warm weather and consequent lessening of retail demand, but also by the possibility of lower freight rates. Dealers hope to take advantage of any possible slump in rail prices.

All docks are carrying heavy loads, and it is freely predicted that further cuts will materialize if the warm weather keeps up. To just what extent these will be made is uncertain, but it is felt that it is imperative to start coal moving now, to prevent a jam later on when the freeze comes.

Shipments from lower ports have dropped off, twelve cargoes being received last week. Only three cargoes are reported on the way. Two boats scheduled to come here have been diverted to other ports where the dock situation is not so acute. Insurance rates doubled on Dec. 1 and it is safe to say that shipments are practically over for the year.

The anthracite condition is unchanged, with prices holding firm, in spite of the lack of demand. This firmness is accounted for by the fact that supplies on docks are not so burdensome.

Complaints have been received of the quality of anthracite being delivered to dealers. Stove and egg are reported as satisfactory, but it is claimed that nut and pea sizes are not being prepared carefully. Dock men have been forced to make price readjustments to cover the discrepancies.

Inland West

CHICAGO

Domestic Market Dead—Steam Grades Scarce—Increasing Tonnage of Eastern Coals—Anthracite Quiet.

The screenings market is holding firm around \$1.65@\$2 a ton, according to the district the coal comes from. Prices are expected to strengthen not because of an increased demand, but on account of curtailed production of domestic sizes. Retailers are not buying coal, and a great many mines which up to now have been running three or four days a week, are closing and a great many more are only operating from one to two days a week. The tonnage figures for Illinois and Indiana mines serving the Chicago market will drop very materially this week.

Many attractive bargains are being offered on Eastern coal and what little domestic purchases are being made are going to Eastern operators. High-grade smokeless 2-in. lump was sold last week at \$2.50 a ton, while it is a very easy thing to do to buy all the egg and 4-in. lump one wishes at a price around \$3. Splints from West Virginia in the 4-in. block size are offered freely around \$2.40, while egg from the same districts can be had at \$2 and sometimes less.

Eastern Kentucky is holding a little firmer, with 4-in. block at \$3@\$3.25, while egg is selling at \$2.25@\$2.75. Some eastern Kentucky and West Virginia steam coal moved into Chicago last week, as the low price on this tends to absorb the differential in the freight over Illinois or Indiana coals.

Even anthracite will soon be face to face with a soft market unless cold weather comes at an early date.

COLUMBUS

Dullness Prevails in All Markets—Warm Weather Stops Domestic Distribution—Steam Stocks Heavy—Distress Tonnage Increases.

The coal trade is probably at its lowest ebb of the year. Production is being reduced to a minimum. This state of affairs is caused by the high temperatures which prevail and the continued industrial depression.

Retailers have large stocks as a rule and are out of the market. They stocked up in anticipation of a rail strike and have been unable to move any great quantity since that time. Prices have weakened to a certain degree and some dealers are offering coal at low figures. The ruling price on Hocking lump is \$6@\$6.50; West Virginia lump, \$7@\$7.50; Pocahontas lump, \$8.50@\$9, delivered. Anthracite is strong around \$15 while coke is quoted around \$11. There is a good deal of distress coal on the market and dealers are able to buy at low prices as a result.

Lake trade is practically closed. The H. V. Docks during the week ended Nov. 26, loaded 50,219 tons, making a total of 4,504,391 tons for the season. During the same week the T. & O. C. Docks loaded 8,632 tons as compared with 15,278 tons the previous week, making 1,086,896 tons for the season.

Steam demand is practically dead. Manufacturers and large steam users have accumulated good stocks and are content to consume these before entering the market. Railroads are not buying to any extent and there is little hope in the immediate future for improvement. Because of the reduction in the output of lump, screenings are showing a little more strength.

The Hocking Valley field is producing less than 25 per cent of normal and the same figures are reported from Cambridge, Crooksville and Pomeroy.

DETROIT

Bituminous Consumers Display Little Inclination to Stock up—Receipts are Not Large—Anthracite Also Sluggish.

Bituminous—While a small amount of bituminous coal is being sold, consumers are continuing the waiting policy which has been a prominent characteristic of the market for several weeks. Jobbers find that even high grade stock from West Virginia mines attracts little interest among their customers.

Though the proximity of the holiday period and the time when many of the industrial plants take their annual inventory is in part held responsible for the limited buying, the natural seasonal recession in trade is exaggerated by the unsatisfactory condition in industrial and business lines.

Another influence deterring action is the expectation that the railroads will put in effect a lower scale of freight rates in the near future and that buyers who are able to hold off on purchases will derive substantial benefit from a reduction in transportation costs.

Lump from Ohio mines is quoted \$3@\$3.25, egg \$2.40, mine run \$1.90, nut and slack \$1@\$1.25. West Virginia lump is \$3.10@\$3.25, egg \$2.50, mine run \$2, nut and slack, \$1.15@\$1.25. Pittsburgh No. 8 inch and a quarter size is \$2.40, three-quarter lump \$2.35, mine run \$2@\$2.15, nut and slack \$1.50@\$1.65. Smokeless lump and egg

is \$4.50, mine run \$2.50, nut and slack \$1.60.

Anthracite—Distribution is proceeding very slowly, orders usually are limited to one or two tons, this buying system being attributable to high retail prices and the extensive unemployment.

ST. LOUIS

Unusual Weather Holds Up Retail Business—Steam and Domestic Demand Light—General Conditions Unsatisfactory—Real Winter Weather Needed.

Warm weather continues. A few cold days some time ago helped the situation temporarily, but it is a hand-to-mouth proposition with the consumer this year and when he does order it is usually the cheapest coal and the smallest quantity.

Dealers have their yards piled up with coal and are beginning to fear that this tonnage will not move until after the first of the year. Carterville is almost at a standstill and Mt. Olive is a close second, while the Standard movement is hardly noticeable.

There is no demand at all for hard coal or smokeless and coke deliveries are practically nil. Even the domestic movement of coal through this gateway has almost stopped. The steam condition is not much better. Prices are unchanged.

CLEVELAND

Market Still Dull—Lake Season Ended—Cleveland Seeks Local Freight Rate Cut—Receipts Dwindle.

The coal market continues extremely soft, with distress stocks gradually being worked off. Added to the considerations of stock accumulations before the recent rail and coal strike threats and slackness of industry, is the nearness of the inventory period. Consumers are unusually anxious to keep their stocks at a minimum at this time of the year.

With the close of November, the largest Lake season since 1918 was ended. The total movement for the season is placed at 22,400,000 net tons of cargo coal compared with 28,153,000 tons in 1918. The movement in November was 1,500,000 tons compared with 2,200,000 in October.

The retail market is rivaling the industrial coal market in dullness. There has been little cold weather as yet. This has had the effect of dampening a feebly reviving household demand. The advent of cold weather is expected to cause a spurt in buying, because consumers have been holding off purchasing in the hope of lower prices and freight rate reductions. One factor which bids fair to help coal sales is the drastic increase in the gas rates. The first month's bills for furnace gas under increased rates in Cleveland and suburbs have caused many users to disconnect gas from their furnaces, and to revert to coal consumption.

An appeal for the reduction of freight rates from the Ohio, Pennsylvania and West Virginia fields to Cleveland is to be made to the Interstate Commerce Commission by Frank Baer, traffic commissioner of the Cleveland Chamber of Commerce. The move comes as the result of the recent reduction of ore rates by 28 per cent. An effort will be made to have the roads bear the whole of a 35c. terminal handling charge assessed by the Erie for coal from other roads handled upon

their lines in Cleveland. The Cleveland chamber believes that coal should be reduced along with ore rates. It is pointed out that in 1918 ore was shipped from Cleveland to Pittsburgh for 91c. against 92c. at present, while coal from Pittsburgh to Cleveland cost \$1.55 in 1918 and \$2.66 a ton now.

Receipts of bituminous coal during the week ended Nov. 26th, were the lowest in several months. A total of 741 cars were received, divided: 451 cars for industries and 290 cars for retail dealers, a decrease under the preceding week of 393 cars. This is quite a contrast with the week ended Nov. 19, when 2,087 cars arrived in Cleveland.

CINCINNATI

Distress Coals Depress Prices — Demand Very Sluggish — Retail Markets Sag.

The process of "getting out from under" was working full force last week and an attempt to quote actual stable prices on the market was merely an attempt to approximate. "Write your own card" is the way that some put it, for in cases of distressed coal it was much more "what will you give" than "what will I get." Field after field is reporting a preponderance of closed mines—some of which announce that there will be no resumption until after Jan. 1. Still the accumulation at the scales continues.

Under pressure of about 1,500 loads backed up at Portsmouth, smokeless prices started to slide, and with reports of sales at \$2.75@\$3 at Chicago and Detroit the market on lump declined to \$3@\$3.50 here.

Bituminous prices were varied, with general underselling necessary to move coal. Sales and quotations on Logan slack were 85c.@\$1; mine run \$1.50@\$1.75; egg, \$2.25; splint lump, \$2.75; gas, \$2.25. Kanawha had a range of about the same figures. Big Sandy slack was 95c.; mine run, \$1.50@\$1.75; egg, \$2@\$2.35; lump, \$2.75@\$3. Southeastern Kentucky slack was 85c.; mine run, \$1.50; 4-in., \$1.35; egg, \$2.25, and lump, \$3.

There was practically no change in retail prices, although values were sagging in this way, that concessions were being made against the usual charge of 25c. for hilltop delivery, where this is usually exacted as a premium. High water in the river was interfering with shipments from that source.

South

BIRMINGHAM

Buying at a Standstill—Industries are Carrying Heavy Stocks—R.R. Fuel Declines—Weather Slows Domestic Business.

The coal market is about as dead as it could be. The sources of consumption for commercial coal are apparently carrying sufficient stocks to take them into the new year, and cannot be induced to place further orders at this time. There is no demand for bunker coal, as there are fewer ships than usual putting into and leaving Southern ports, and the consumption from this source is reduced below normal tonnage.

Contract consumers are taking as little coal as possible, as their stock

piles were built up to some extent in anticipation of the rail strike and they are not now taking near their average tonnage. The railroads particularly are holding off on deliveries against their fuel contracts.

The domestic situation is also critical so far as the producer and retailer are concerned. The continued warm and unseasonable weather is proving their undoing and the output of the mines is disposed of with difficulty and delay.

There is so little inquiry that prices really cannot be called "quotations," but figures at which steam and domestic coals are moving are practically without change from those given a week ago.

LOUISVILLE

Business Poor, General Outlook Gloomy — Many Mines Down—Wage Cut in Southeastern Kentucky.

Jobbers and producers are all having their troubles just now as a result of continued mild weather and lack of demand. The trade has not recovered from overproduction and stocking in October, and contract customers are not even taking their requirements, much less accepting their December or January supplies ahead of time and enabling the mines to keep going.

More mines are closing down in eastern Kentucky. The southeastern field has just made a wage cut of 27 to 30 per cent in trying to compete with the non-union West Virginia fields.

It is believed that a heavy buying movement will set in in advance of the ending of the present wage agreement with the miners in March, as it is thought there will be a wide-flung miners' strike at that time.

Little business is anticipated during December. Retailers are buying just a little steam coal to fill their local plant contracts, but have fair to heavy stocks of prepared sizes on hand, and are not showing any interest in such.

Southwest

KANSAS CITY

Summer Weather Curtails Domestic Trading—Steam Sizes Short—Business Conditions Poor.

Summer weather prevails throughout the Southwest. Retail dealers are doing practically nothing. A great many residences are using no fuel and lack of domestic demand has created a shortage of steam grades. In some instances screened nut has been used for steam purposes.

About 25 per cent of the miners in Kansas have resumed work. Business generally in the Southwest shows very little improvement. There is a great lack of employment and market for goods produced. The Southwest being the agriculture and stock territory, is greatly affected by the low prices for grain and live stock and the high freight rates necessary to get it to market.

Prices are as follows: Kansas lump, \$5, mine run, \$4@4.25, nut, \$4.50, mill, \$2.75, slack, \$2.50; north Missouri lump, \$4.75, mine run \$3.50, washed slack, \$3.25, raw slack, \$2.50; Arkansas lump, \$7@\$7.50, mine run, \$3.75@\$4.25, slack, \$2.50@\$2.75; Oklahoma lump, \$8.50, nut, \$7, slack, \$2.50@\$2.75. Springfield district, Illinois lump is \$3@\$3.75, egg, \$3@\$3.25, slack,

\$2@\$2.10; Franklin County, Ill. lump is \$4.25 and egg \$4.05.

West

DENVER

Price Reduction Follows Wage Cut — Strike Losses Are Insignificant—Situation Well in Hand.

With the 30 per cent cut in wages to miners in thirteen Colorado Fuel and Iron Co. mines recognized by practically a normal force of workers, other operators are thinking of making a similar reduction at their mines. A reduction of \$1 a ton on lump and nut at the mines was announced by the Colorado Fuel and Iron Co., effective Dec. 1 and is in line with the recent reduction of wages.

The strike has not been called off, and the Las Animas and Walsenburg bituminous districts are still under material law. No serious outbreaks have occurred. The union leaders have not indicated what, if any, move they will make. The state-wide sympathetic strike did not work out as planned, although six mines in Fremont County district are still shut down.

Production for the week ended Nov. 19 was 66 per cent of capacity, an output of 189,991 tons. Lack of orders was equivalent to 28 per cent. Strike losses reported by the Colorado Coal Operators' Association equalled only 1,000 tons.

SALT LAKE CITY

Retail Business Fluctuates—Industrial Conditions Poor, but Outlook Is Improving—Production Low.

Retailers report a fair business, but the volume is much less than it should be considering that only a few people have ordered their winter coal so far. The idea of storing coal seems to have lost favor with the majority of consumers; they prefer to buy from hand-to-mouth.

There is very little, almost nothing, doing in an industrial way. Business men in all lines, however, are optimistic. The copper mines will, without a doubt, be reopened by early summer, while there is a reasonable prospect of a \$25,000,000 steel plant being set up. It is expected that production this year will scarcely exceed 4,000,000 tons, or 30 per cent less than last year's output.

Canada

TORONTO

Mild Weather Keeps Trade Quiet—Market Well Stocked—Bituminous Selling Slowly at Softer Prices.

The trade continues quiet, owing to the mildness of the weather. Most domestic consumers are merely buying from hand to mouth and a continuous cold snap would find many householders unprepared for it. Dealers have ample stocks of all grades of anthracite on hand, with the exception of stove, which is hard to obtain.

The situation as regards bituminous shows no change, except that wholesale prices are slightly easier on 3-in. lump, being quoted \$7@\$7.75. Other quotations are unchanged. Demand is very light and the market is overstocked.

News From the Coal Fields

Northern Appalachian

CONNELLSVILLE

Market Still Softer—Demand Almost Absent—Little Interest in Contracts.

The coke market has grown still softer, on account of the continued absence of demand. Production by the merchant ovens has decreased about 30 per cent in the past five or six weeks and still seems to be somewhat in excess of requirements while there is an accumulation on track waiting to be moved. There has been practically no buying by furnaces for several weeks, and the miscellaneous demand, never large, has been particularly light, demand from smelters having almost disappeared.

A price of \$3, a fortnight ago the minimum of the market, is now merely a nominal asking price, with prospects that it could be shaded on inquiry for a round lot. It is reported that a sale, December to March inclusive, has been made at \$3.40, but this is not absolutely confirmed. A sale for December alone has been made at about \$3.15. Furnaces now in operation are showing no interest in renewing contracts for any part of the new year.

Foundry coke continues in light demand. Some special brands are held at up to \$4.50, but meet with extremely limited sale. There is occasional inquiry for prices for first quarter, but operators do not regard such inquiry seriously.

The market is quotable generally at \$3 for spot furnace, \$3.15@ \$3.40 for contract furnace and \$4@ \$4.50 for spot foundry.

The *Courier* reports production in the week ended Nov. 26 at 42,860 tons by the furnace ovens, an increase of 7,520 tons and 31,760 tons by the merchant ovens, a decrease of 1,580 tons, making a total of 74,620 tons, an increase of 5,940 tons.

PITTSBURGH

Production Very Light—Unable to Meet Competition of Non-Union Fields—Proposed Combination of Panhandle Mines.

Coal continues at a very low rate, and scarcely any of it is against current sales. There are some contracts in force, largely for gas coal, and the Panhandle district is selling some domestic. As for many months past, the position is that the average buyer fills his wants in non-union fields, particularly Westmoreland and Connellsville, where prices are much lower on account of labor costs having been liquidated. The Panhandle operators show a lower cost than other portions of the Pittsburgh district for various reasons, the chief of which is that their exhaustion charges are less.

Even Panhandle coal, however, seems to be selling at a loss since there are cases of 13-in. domestic going at \$2.75 when the slack may go at as low as \$1.25, making an average of \$2.25 for the run of the mine. Westmoreland and Connellsville coals are bringing

\$1.50@ \$1.90 for mine run, prices with which union mines cannot compete.

A movement is on foot for the merger of about twenty mines in the Panhandle district, the object being to reduce expenses and secure a better representation for the district in wage adjustments.

Slack is being sacrificed, as it is produced in excess of demand in making shipments of screened gas and domestic lump. We continue to quote mine run \$2.10@ \$2.20 and 3-in. \$2.60@ \$2.70, covering steam and ordinary grades of gas. High grade gas is held at \$3 or higher, but meets no sale. Panhandle 13-in. domestic is easier, selling \$2.75@ \$3.

EASTERN OHIO

Production Declines—Industrial and Domestic Stocks Preclude Buying—Outlook Fails to Improve—Lakes Closed.

Production during the week ended Nov. 26 was 285,000 tons, or 56.6 per cent of potential capacity for the five-day week. Notwithstanding the observation of the Thanksgiving holiday and the natural expectation that the daily average would probably be increased thereby, mines averaged but 57,000 tons per day, and the output was 98,000 tons less than in the preceding week.

Association mines worked 43 per cent of possible worktime during the period as compared with a little better than 50 per cent the preceding week. No market conditions at the present time may conservatively be placed at between 50 and 55 per cent. Mines on the Pennsylvania showed the greatest decrease in the time worked, those on the B. & O. and Wheeling & Lake Erie not being so precipitous in their declining operations.

With continued mild weather and no appreciable increase of traffic, and the further fact that most roads stocked up heavily several weeks back, the quantity of railroad fuel going to the carriers has diminished considerably.

Cumulative figures for the calendar year show an aggregate output of 16,331,000 tons as against a potential capacity of 29,192,000 tons.

The present lack of demand is not an unexpected outcome of the stocking up which took place during the close of October and early November. With industrial consumption as well as the railroads continuing sub-normal and retail yards remaining well filled, it is generally felt that market stagnation may not break for several weeks. The outlet afforded by the Lake shipping is just about closed; in fact, the next ten days will probably see the final cleanup of the season.

The various rumors and predictions that there is an impending reduction in freight rates is another factor contributing to the uncertainty in the trade. Some buyers are holding off and not ordering more than current requirements on this account. It is not improbable that additional mines will be closed down unless there is an improvement in the situation.

Owing to the smaller volume of prepared sizes now being moved, spot prices on slack have stiffened somewhat because of the consequent scarcity of this grade. As contrasted with this situation in slack coal, other prices have softened.

CENTRAL PENNSYLVANIA

Overproduction Responsible for Present Market Slump—Non-Union Mines Continue Better Run—Current Buying Only.

The industry is again at a low ebb. Overproduction is one of the chief causes of the present slump. The threatened disturbances in the latter part of October caused buyers to stock up for the first time in many months and it will be some time yet before these stocks are used up.

Buyers, as a rule, are holding off on account of a possible reduction in freight rates and are ordering only what coal is needed for immediate use. Whether the reduction comes or not, coal will be in demand by the first of the year and operators predict a considerable pick-up. Union mines in many places remain idle while the non-union operations are maintaining a 60 per cent production.

Spot prices on all grades are below the cost of production. It has been found that the mines in Maryland and West Virginia are selling coal to the inland towns at a lower rate than that for which coal from this field can be mined. In those fields, the cost of production is 80c. to 90c. as against \$1.20@ \$1.30, and \$4 for labor as against \$7.50 in the union field of central Pennsylvania.

UNIONTOWN

Production Low—Coal and Coke Markets Continue Weak—Frick Ovens Increase.

Coal and coke production in the Connellsville bituminous region fails to show much reaction from the slump which appeared a short time ago. Frick coke ovens have been increased in operation but this is the only feature along that line.

The market continues soft, with no demand and prices at low level. Furnace coke is quotable around \$3 and upwards; foundry at \$3.75 and coal at \$1.15 up. The principal reason given for the extreme dullness seems to be necessity of reduced freight rates and a persistent rumor in the region that decreased tariffs may be expected soon.

FAIRMONT AND PANHANDLE

Holiday Idleness and Poor Markets Cut Production—Cancellations Heavy—Spot Buying at Minimum.

FAIRMONT

Only a small portion of northern Western Virginia mines were at work during the week ended Nov. 26. The Thanksgiving holiday cut down production but there was so little business available that there was no need for heavier operations. Lower prices on the spot market were responsible for many cancellations and rejections, and prepared grades along with others, suffered as a result.

NORTHERN PANHANDLE

With industrial demand only about 50 per cent of normal and with railroads taking little fuel, production was materially reduced. Thanksgiving

Day caused most of the mines to close for the balance of the week. Spot buying was virtually at a standstill and the Lake season was at an end, the railroads taking the bulk of the output.

UPPER POTOMAC

Mine Idleness Continues—Non-Union Competition too Stiff—Prices Only Nominal.

Not more than a dozen of the fifty mines in the Upper Potomac region were able to operate at all during Thanksgiving week. Mine owners cannot compete with the non-union fields, and where the wage scale was adhered to there was no operation because of the depressed market and high production cost. Similar conditions prevailed in the George's Creek region, where none but a few Big Vein mines were running. Nominal quotations ranged \$1.50@ \$1.75.

ANTHRACITE

Operations Close—Demand Slipping—Warm Weather Curtails Market.

Last week was almost strikeless in the field, the only trouble being at the Marvine Colliery of the Hudson Coal Co., caused by the introduction of the check-out system. However, this was of short duration. The case has been put up to the Anthracite Board of Conciliation.

Warm weather has adversely affected the market, and it is very difficult to move pea and chestnut. The demand for boiler sizes is a little better. Some of the large retail dealers state they have stocks sufficient to last them until April.

One of the large companies in the Schuylkill region has closed down for three days. Another company has closed down one colliery for the same period.

Middle Western

SOUTHERN ILLINOIS

Warm Weather Halts Domestic Movement—No Steam Activity—Railroad Tonnage Light—Many Mines Suspend.

In the Carterville field conditions have reached a critical stage in the way of movement of the larger sizes. Many mines have not worked for a week or ten days and others have been getting one or two days a week. Two large mines in Franklin County are making desperate efforts to work every day, but other mines of the same companies are suffering as a result.

The domestic movement has practically stopped. Tonnage to the Southwest through the Thebes gateway has ceased altogether. Warm weather is principally the cause of the tieup, but information from retail sources indicates that thousands of customers who have heretofore used the best Illinois coals are financially able this year to buy only the cheaper grades and in small quantities.

The steam market has strengthened some on screenings and also on nut, but egg and lump are heavy and there are trainloads on every sidetrack through the southern Illinois field. A report a few days ago showed something like 2,000 cars on hand without disposition and the situation has not improved since then.

Railroad tonnage has eased up. As-

sociation prices still prevail at \$4.05 for lump and egg and about \$3.50 on nut, with screenings \$1.50@ \$2. Independent prices are somewhat under these, with nut as low as \$3 and lump and egg \$3.25. Independent screenings, however, are up with the association prices.

Somewhat similar conditions prevail in the Duquoin district except that operations are on an even lower scale. In the Mt. Olive field the situation is giving great concern to the operators. Domestic tonnage has practically fallen off to one day a week and the tracks are loaded with lump, while just enough of the steam size is being produced to take care of contracts.

The Standard situation is a deplorable one. Many mines have been idle for two weeks, with no early chance of resuming. Some mines have had lump on track for twelve days and demand is so poor that there is no chance of moving it until extremely cold weather comes.

Steam sizes, such as screenings, are moving fairly well and small nut is in good demand. Railroad tonnage is fairly good, everything considered. There is some unrest at many mining towns on account of the poor working time.

MIDWEST REVIEW

Domestic Markets Inactive and "No-Bills" Increase—Steam Coals Short—Eastern Fuels in Keen Competition.

Warm weather, combined with continued agitation for a reduction in freight rates on coal, has resulted in a complete stagnation of the market.

Practically no domestic is being purchased. Retailers have as much coal on hand as their bins can hold and are not forcing their own trade to take any tonnage, claiming that rural credits are such that practically all business has to be done on a cash basis. While retail dealers have no very general idea of the freight rate situation, they all believe that rates will have to be reduced quickly. They are, therefore, not in a buying mood. However, they are holding back principally because they cannot move what they already have on hand, and the prospects will be poor until the Middle West gets some seasonable weather.

Prices on steam coals are strengthening to some slight extent, not on account of an increased demand, but because of a decrease in production of domestic sizes. Operators in the more favored fields of southern Illinois are now holding their screenings \$1.50@ \$2, with an average in the vicinity of \$1.85. There are plenty of reports of "no-bills" at the mines, but investigations show that most of this coal is domestic rather than steam, as when the market is extra poor on screenings, the larger southern Illinois operators send it into storage rather than to attempt to sell on the open market. Production is decreasing rapidly and mines are now working less than three days a week.

Judge Anderson's injunction against the check-off has ceased to be a factor in the market. It is impossible at this writing to give any reliable information as to when a judgment will be handed down on the appeal. In the event, however, that a judgment upholding Judge Anderson's injunction is handed down within the next few days, it will have little effect on the

coal industry, because it is anticipated that the United Mine Workers will again appeal their case to the Supreme Court, where the case will probably remain until after the present expiration of the contract with the U. M. W. These circumstances being taken into consideration, operators doubt very much if a strike will materialize before the expiration of the working agreement with the miners in March.

Competition from Eastern coals is seriously affecting the Middle West market. West Virginia slack at 65c. @ 75c. has moved and in some cases displaced good Indiana and Illinois coal. Considering the higher quality of the Eastern coal, the differential in the freight rates between Eastern and Western coal is practically eliminated.

Franklin County screenings can be bought at \$1.85 a ton, f.o.b. mines. The freight rate to Chicago is \$2.16, making a total of \$4.01. Eastern screenings with a freight rate of \$3.43, can be bought f.o.b. Chicago at \$4.08. Considering the natural qualities of the two coals, it can be easily understood why industries who are buying at all, are taking Eastern coal.

Most of this cheap coal comes from non-union fields, who can compete on account of the reductions that they are able to make from time to time on labor. We heard of one case last week, although it is not authenticated, where operators in a certain field in West Virginia meet every week and decide on what scale they can afford to pay their miners in order to meet existing competitive conditions. Illinois and Indiana operators, who are unable to change their wage scale, are thus at a great disadvantage.

WESTERN KENTUCKY

Shipments Steadily Slumping—More Mines Close—All Demands Are Weaker.

Movement of coal has been slowing down materially, while more mines are closing down for lack of business. Prices are not so much of a factor, in view of the fact that the Illinois, Indiana and western Kentucky mines are working along under the union wage scale, while western Kentucky has the advantage of eastern Kentucky in the matter of freight rates to Louisville.

Demand simply does not exist, retailers having fair yard stocks on hand. Industrial consumers do not want to carry over reserves on their inventories, as it is going to be hard enough for a lot of them to make a good showing this year without the added burden of heavy coal stocks.

If industrial conditions improve, or cold weather cleans up retail stocks, prospects point to a better movement shortly after the first of the year.

Southern Appalachian

SOUTHEASTERN KENTUCKY

Market Is Lifeless—Majority of Mines Close—Prices Drop Further.

With a lifeless market and most prices under production cost, a large number of mines in Harlan and Bell counties have closed down. On Dec. 1 there were probably no more than 15 or 20 per cent in operation in the entire section.

This has materially reduced the output, but so far, no increase in demand

or price has been noticed. In fact, prices are now lower than for some weeks, best block selling as low as \$3 and slack 85c.@\$1.

Middle Appalachian

LOW-VOLATILE FIELDS

New River Operations Hard Hit — Market Oversupplied—Lake Outlet Removed—Prices Weaker.

NEW RIVER AND THE GULF

Heavy coal supplies on New River markets precluded much production during the week ended Nov. 26, and the output continued at a low level, not being over 11,000 tons daily. Only a few mines in the entire field were operated. Demand was almost completely dormant for all grades and prices were largely nominal. Neither at Tidewater, where so large a tonnage of New River is usually shipped, nor in the West, where the majority of domestic sizes move, was there any demand worth mentioning.

Winding Gulf production continued to drop as there was a large accumulation of unsold coal in Western markets and at Tidewater. Only a small proportion of the mines were in operation and all activity was suspended on Thanksgiving Day, much idleness also extending through the remainder of the week.

POCAHONTAS AND TUG RIVER

With the removal of Lake business,

Pocahontas production was materially curtailed. The tonnage dropped to about 270,000 with no market losses about 140,000 tons. Very little coal was moving to coastwise markets and Western shipments continued to be the heaviest.

More coal was produced proportionately in the Tug River section than in others, although the ending of the Lake season had its effect. The holiday cessation of work was also a factor in cutting production, and car shortage continued to be felt. The best market was in the West and the bulk of the output moved in that direction. The only spot demand was for prepared sizes and prices were lower all around.

HIGH-VOLATILE FIELDS

Idleness Most Pronounced — Warm Weather and Poor Industrial Conditions Affect All Grades—Distress Tonnage Heavier.

KANAWHA

Thanksgiving week was marked by the most extreme dullness of the year, and production was cut to the very quick. Holiday idleness made no material difference as production during the early part of the week was more than sufficient to fill all orders in hand. Cancellations and rejections also made heavy inroads on current production.

LOGAN AND THACKER

Logan production slumped materially during the week. With the sluggish commercial market and the cessation of Lake shipments, only contract orders were in evidence. Prices, which

were only nominal, were on an even lower basis than before.

No market losses amounted to nearly 50 per cent, or more than 100,000 tons in the Williamson field. There was also a 3 per cent loss from car shortage. The market was inactive but between general contract shipments and railroad fuel, operations in many instances ranged up to three days. The greater part of the commercial output went to Western markets.

NORTHEASTERN KENTUCKY

Mild weather made it impossible to produce much prepared coal, and industrial conditions were against any improvement in steam movement, so that the output was very low. Thanksgiving Day also cut down the tonnage, which was not over 30 per cent for the week. There was less buying in the Southern and Western markets and sales were limited largely to distress coal, much of which could be easily obtained.

VIRGINIA

Production still averaged about 60 per cent, although the output was not as large as usual, owing to the Thanksgiving Day idleness, which extended in part to the beginning of the following week.

Spot buying was largely absent, although sales were not being encouraged by producers because of the low price levels prevailing. Much of the production was moved on a contract basis and the best call was, of course, for prepared sizes.

News Items From Field and Trade

ALABAMA

Charles Butts of the Geological Survey has gone to Birmingham to do work in the Montevallo Basin of the Cahaba coal field for the State Survey.

The Henry Ellen Coal Co. has been incorporated in Jefferson County and will operate a mine in the Cahaba River field. Incorporators are A. C. Payne, president; J. M. Donaldson, vice president and general manager, and Tom Stobert, secretary-treasurer. The capital stock named is \$25,000. Offices are located in Birmingham.

ILLINOIS

The Eagle Valley Coal Co. has been organized at Harrisburg, with a capital stock of \$1,000,000.

W. H. Parker, who has been associated with the Consumers Co. for seven years has entered independent business for himself and with William Mitchell will engage in the coal and ice business in Elgin.

Thomas L. Harris, coal operator of St. Louis has purchased the controlling interest in the mine of the Madison County Mining Co., at Edwardsville and has taken charge of the property.

The property of the Griffin Coal Co., near Aledo, consisting of a shaft, tippie, machinery, etc., has been sold at sheriff's sale to satisfy a judgment held by a bank amounting to \$2,282. The property was bid in by Henry White, representing the bank, for \$1,022.

INDIANA

The Anderson City Board of Works is ready to receive bids for furnishing 35,000 tons of coal. That will constitute a year's supply for the municipal light and water

plant. Last year the city paid \$2.95 a ton, but the board expects to shade that figure this year.

The Miami Coal Co. has purchased the Black-Hawk Mine, twelve miles southeast of Terre Haute, which was owned by Robert Smith, Andrew Spears, Charles Kidd and some minor stockholders of Terre Haute and Brazil. H. V. Sherburne, general manager, James Connery and John Connery are the chief owners of the Miami Co., which operates Mines Nos. 5, 7, 8, 9 and 10 in the Clinton field.

The grand jury of Spencer County has returned thirty-one indictments against coal miners in Pike, Dubois and Gibson counties, charging conspiracy to riot and rioting. The indictments grew out of the march of 200 or more miners from Pike County to Lincoln City, Oct. 18, when the non-union men employed in the Fox Hill and Oak Knobb mines were forced out.

The Vandalla Coal Mine No. 23, in the Linton field, resumed operations recently following a four months' shutdown due to the burning of a tippie. A large steel tippie has been erected and the mine re-modeled.

The City of Logansport has filed suit in one of the Marion County Superior Courts, at Indianapolis, against the Ogle Coal Co., for damages amounting to \$30,000 for alleged breaking of contract. This is the amount of extra money the city alleges it was forced to pay for coal on the open market through failure of the coal company to keep its contract with the city last year to furnish coal at the rate of \$1.95 per ton.

The Ayrshire District Collieries Co., which is sinking a shaft east of Princeton, now down in the rock about forty or fifty feet, is sinking another 300 feet south of the first one. The second is down thirty feet. This is a departure in southern Indiana

coal mining, the usual practice being to sink a second and smaller air shaft. Sometimes however, the bottom is better at the air shaft than at the main hoisting shaft. In the present case the company is making both shafts the same size so that whichever is found to have the better bottom will be made the hoisting shaft. The double-shaft plan is the idea of William Johnson, Vincennes, president of the company.

The W. H. Howe Coal Co. has increased its capital stock from \$10,000 to \$25,000.

KENTUCKY

The Peerless Coal Mining Co., after a shut down of more than a year, has resumed operations, and expects to be moving fairly large tonnage by Jan. 1.

As a result of a cut of 17½c. on a mine car of coal, 100 miners employed by the Storm King Coal Co., at Storm King, and Columbus Mining Co., at Christopher, in the Hazard field, have walked out on strike. It became necessary to cut prices in order to secure business and meet strong competition.

The John P. Gorman Coal Co., capital \$100,000, has been chartered by John P. Gorman, Tom L. Gorman and Mary E. Gorman, all of Lexington.

Charles F. Richardson, of the Sturgis Coal Co., is building what is said to be the largest towboat on the Ohio River, to handle coal tows from Caseyville, to lower points on the Ohio and Mississippi. The boat will be 208 feet long, have eighteen water-tight compartments of the non-sinkable type.

The Hamblett Mining Co., of Morton's Gap has filed amended articles increasing its capital from \$45,000 to \$60,000.

The Duvlin Coal Co., of Providence, has been incorporated by Douglas J. Ruckman, Francis V. Ruckman and Helen Ruckman.

Amended articles have recently been filed by the B. & B. Ice & Coal Co., Louisville, increasing capital from \$60,000 to \$90,000.

The Golden Ash Coal Co., Williamsburg, capital \$50,000, has been chartered by N. A. Archer, William Archer and A. V. Brown.

The Elkfield Coal Co., Garth, capital \$25,000, has been chartered by J. C. Bowman, R. Q. Young and James Moore.

C. F. Lowther, of the Allied Coal Co., and Sun Coal Co., Louisville, has filed suit in the Warren Circuit Court, Bowling Green, to force R. J. Fricke, oil operator, to turn over oil properties under agreement by which Lowther was to pay \$40,000 for the property. The Illinois Producers Oil Co. is a party to the suit. Lowther demands either the property or \$50,000 damages.

MINNESOTA

A letter from F. R. Wadleigh, chief of the coal section, fuel division, department of commerce, Washington, to Congressman Clague, of Minnesota, has been published touching the fuel situation in Minnesota, as a sort of response to the report to Governor Preus, of Minnesota, from N. J. Holmberg, state commissioner of agriculture. Wadleigh's letter criticizes Holmberg's report as being lacking in constructive suggestion and containing irrelevant matter. Wadleigh's letter is exquisitely governmental. It would apportion coal buying to the nearest source of supply, the Illinois mines, would gradually eliminate anthracite from the Northwest; would establish central storage spaces, and would investigate the development of coking plants. Users would have no option but to do as they were told. And yet the Northwest has more storage than all other sections of the country, has done more toward preparing in the summer to store for the winter, and has by compulsion sought to answer all questions affecting coal supply. Just why the Illinois mines should be given a monopoly when the rail haul for lake and rail delivery to the Twin Cities for instance is less than the rail haul from Illinois mines alone? In fact, the whole question is open to debate as to why coal buyers should not seek such coal as they prefer and why coal producers should not seek such markets as they may, instead of attaching consumption to certain fields of production as the Russian serfs used to be attached to the land.

OHIO

Quin Morton, well-known operator in the Kanawha field, was a recent visitor in Cincinnati.

D. H. Pritchard, general manager of the Virginia Fuel Co. and J. M. Strunkorff, sales manager of the Reliance Coal and Coke Co., both of Cincinnati, recently returned from a visit to Chicago.

The Hopewell Coal Co. has been incorporated with a capital stock of \$125,000. Incorporators are H. Gross, R. Grant, Sr., Cumberland, Md.; E. G. Kimball, S. N. Moore, J. F. Gross, Keyser.

The nominating committee of the Cincinnati Coal Exchange have selected the following candidates for election to the directorate: N. L. Mahan, W. E. Denham, R. B. Hager, R. S. Magee, William Heltzman and Ed. Harper. Three are to be elected at the elections which will be held at the Chamber of Commerce on Dec. 15.

A case of more than usual interest has been on trial before Judge John Weld Peck of the United States District Court in Cincinnati. It is the trial of the \$35,000 breach of contract case of H. P. Brydon & Bro., Piedmont, W. Va., against the Reliance Coal and Coke Co., of Cincinnati. The charge is made that the defendants failed to take coal contracted for delivery to the Baltimore Manufacturing Co., while the defense is that the contract was in force only as long as the Baltimore concern agreed to accept the coal. Because of the wording of the contract it is contended that the decision will have bearing on many others in which identical terms have been written.

OKLAHOMA

Coal mines in Oklahoma produced a total of 3,547,432 tons during the fiscal year ended June 30, 1921, according to the annual report of State Mine Inspector Ed. Boyle, just completed. This is 440,420 tons less than was produced during the preceding fiscal year. Pittsburgh County led all others in the production.

PENNSYLVANIA

The Harwick Coal and Coke Co., is the new name of the Equitable Coke Co., Pittsburgh.

The purchase of 14,000 acres of coal land in Greene County has been made by the Jones & Laughlin Steel Co. The purchase

was made from the Piedmont Coal Co. and is said to involve several millions of dollars. The property lies along Dunkard Creek, near the town of Point Marion.

James W. Darville, has resigned as general sales manager, Cory Mann George Corporation, New York City, to accept position as sales manager, Wentz Co., Philadelphia.

M. L. Taylor of the Morgantown Coal Co., with headquarters at Morgantown, W. Va., spent a few days in the Philadelphia market recently.

A business trip to Pittsburgh was recently made by Benjamin Chaplin of the Chaplin Collieries Co. of Morgantown.

The formation of the Benjamin Coal Co. was announced when papers were filed showing a company made up of W. L. Houck, Frank P. Benjamin and George W. Maxey of Scranton, and Joseph E. Fleitz of Wilkes-Barre. This company has taken over a large operation in Jenkins Township, Luzerne County, and will immediately begin the production of coal.

Although the Baltimore Shaft of the Hollenback Colliery, Lehigh & Wilkes-Barre Coal Co., will remain out of commission for a considerable period as the result of a recent fire, employees will have the chance to work. Coal is to be hoisted by way of the slopes, permitting actual mining on nearly the regular scale, while employees who are unable to work at their accustomed jobs will be used in making repairs to the damaged shaft.

The J. S. Wentz Coal Co. has taken over the leases and equipment of the McTurk Coal Co., with operations at Girardville. This mine will be operated in conjunction with the Raven Run, Hazlebrook, Upper Lehigh, Maryland and Mid-Valley mines, now under the supervision of T. E. Snyder, of Hazleton.

Madeira, Hill & Co. has informed the trade that Lester C. Bosler, mechanical engineer and for many years in charge of the power plants at the Nicetown works of the Midvale Steel Co., has become connected with the distributing department, and will give advice in regard to the proper kind of coal to be burned under given conditions.

The Walter J. Crowder Co., which for many years has conducted a retail coal business in Germantown and Oak Lane, has notified the trade it has decided to change its name to the Suburban Coal Co. William T. Brandreth, who has been with the house for more than twenty years, continues as president and manager.

UTAH

Frank H. Rolapp and others received judgment for \$4,165 and costs in the suit against Margaret Kay and others. The action was brought to recover \$30,000 alleged to be due as the result of the taking over of the Lincoln-Kemmer Mine by the defendants after a lease had been secured by plaintiffs.

The Equitable Coal Co., recently organized to operate in Carbon County, is opening up a mine on Willow Creek. Operations will start in the early spring, or sooner if weather permits. Offices are in Salt Lake City.

WASHINGTON, D. C.

W. B. Upton of the Geological Survey has completed field work in the coal fields of the Wasatch Plateau, Utah.

Argument will be heard, beginning Dec. 8, in the District of Columbia Supreme Court in the case of the Claire Furnace Co., involving the right of the Federal Trade Commission to require cost reports in the steel and coal industry.

The Court of Claims denied the suit for \$58,036 of the J. M. McDonald Coal Mining Co., for alleged losses due to fuel prices fixed by the Government during the war. The court holds that the Lever Act authorizing fuel control did not make the Government liable for losses on contracts.

Coal operators were absolved from responsibility for high coal prices by Senator Stanley, of Kentucky, in a Senate debate. He declared: "During the time that coal was sky high, the great mining concerns attempted to keep down the kiting of coal. I know of concerns that sold coal at \$1@ \$5 a ton less than they could have obtained for it in an open market because they believed it was in an unhealthy condition." He said however that while fuel prices had declined the prices of other commodities made from cheaper material and cheaper labor remained high because of combinations in restraint of trade.

The members of the subcommittee on coal of the Federal Purchasing Board which will supervise details of purchases of coal by the Government have been appointed. In addition to F. R. Wadleigh, the chairman, Commander E. A. Cobey, in charge of Navy coal purchases and Colonel T. B. Hacker, in charge of Army coal purchases will compose the committee. The committee will study the coal market, seeking to advise as to the most practicable times and places to make purchases.

The General Land Office of the Interior Department has ruled that an application to purchase coal land under Section 2347 R. S. to be entitled to consideration as a valid claim existent at the passage of the leasing act must thereafter be maintained in compliance with the pre-existing law under which it was initiated. Where the application was filed on the day the leasing act was approved, the applicant will not be permitted to prove that it was filed prior to the time of actual approval if the applicant has failed to comply with the conditions of the act under which the claim was initiated and of the regulations thereunder relating to its maintenance.

In the suit of Texas vs. the I. C. C. before the Supreme Court the constitutionality of Paragraphs 18 to 22 of Section 402 of the Transportation Act is involved. The case grows out of the section of the I. C. C. in ordering the abandonment of the line of the Eastern Texas R.R. from Lufkin to Crockett, Tex., which line was promoted by the Texas, Louisiana Lumber Co., a subsidiary of the Central Coal and Coke Co., of Kansas City. The State of Texas resists the power of the commission to abandon the line, contending that the State only has authority.

The President has signed a bill passed by Congress, thereby making it a law, authorizing the **Rolph Navigation and Coal Co.**, to sue the Government for damages caused one of its boats by a naval vessel in San Francisco harbor.

WEST VIRGINIA

Organization of the Dixon Coal Co., with headquarters in Keyser is the forerunner of further development of coal lands in Clay District of Harrison County. Back of the new concern are men well known in the coal circles of Mineral County and Cumberland, Md. This company is capitalized at \$175,000, which indicates in a measure the scale upon which operations will be conducted. Leading figures are James E. Cross, S. N. Moore and Edward G. Kimmell of Keyser; Howard Cross and Robert Grant, Sr., of Cumberland, Md.

Beckley business men have launched what is to be known as the **Coal Service Corporation**, the general headquarters of which are to be at Richmond, W. Va. Actively identified with the new company are: F. L. Conway, W. H. McGinniss, Jr., H. A. Conway, T. L. Conway and P. J. Conway, all of Beckley.

In the future the **Arthur D. Cronin Coal Co. of Detroit**, will be known as the **Hinchman Creek Coal Co.**, authority having been granted by the Secretary of State to the company to change its name.

A visitor in the Kanawha region about the middle of November was S. G. Smith, general manager of the Kanawha & Ohio Coal Co., with headquarters at Columbus.

The **Raleigh Wyoming Coal Co.** of which Carl Scholz is vice-president and general manager, is experimenting with a wireless telephone system at its offices in Charleston with a view to installing this for use between the mines in Raleigh and Wyoming counties and the general office.

Geo. P. Daniels, general manager of the Smokeless Fuel Co., with general offices in New York, was a recent visitor at the main office of this company in West Virginia.

William McKell, president of the McKell Coal & Coke Co., with headquarters at Glen Jean, has resigned as a director in the American Constitutional Association and has been succeeded by former Governor John J. Cornell.

W. M. Wiley, general manager of the Boone County Coal Corporation, located at Sharples, was the principal speaker at a meeting of the American Constitutional Association recently held at Huntington.

John L. Cochran, who is located at Denver, Col., but who owns a good deal of coal property in southern West Virginia paid Charleston a recent visit.

Extensive improvements are being made at Mine No. 9 of the **Jamison Coal & Coke Co. at Farmington**, with a view to increasing the capacity. Electrical equipment is now being installed.

The **Stone-Scott Coal Co.**, has been active in the purchase of coal land in northern West Virginia. One purchase was from the **Fairmont-Sewickley Coal Co.**, of Fairmont, this tract being on the West Fork River at White Rock, the coal being in the Sewickley seam. The company also secured from Thomas S. Neptune and Jacob F. Straight a parcel of Waynesburg coal land.

It is possible that an option given by the County Court of Monongalia County to Samuel Purselove of the **Cleveland & Morgantown Coal Co.** for the purchase of \$350,000 worth of bonds of the Morgantown & Wheeling Ry. may be exercised, the option expiring on Dec. 6. It is understood that the option for the purchase was at the rate of fifty cents on the dollar for the bonds. The court has control of the bonds owing to the fact that several magisterial districts of Monongalia County bonded themselves to aid in the construction of the railroad which has been in the hands of a receiver for the last few years. The Morgantown & Wheeling road connects with the Monongahela Ry. at Randall.

A. J. Salzer of the Southern Coal Co. of Fairmont was a business visitor in Weston recently.

Traffic News

The commission has denied petitions for rehearing of the cases of the **Spring Valley Coal Co.**, and the **Central Illinois Coal Traffic Bureau**. In these cases the commission decided that rates from various mines in Illinois to the Northwest were prejudicial.

The commission has denied application of the B. & O. for rehearing in the complaint of the **Meyersdale Smokeless Coal Co.** In this case the commission found that the refusal of the B. & O. to furnish cars to the Meyersdale company at Casselman, Pa., for transportation of coal, while furnishing cars to other shippers, was prejudicial to the Meyersdale company and preferential to its competitors.

The **Watertown Chamber of Commerce** has been allowed to intervene in the case of the Milwaukee Association of Commerce before the I. C. C. which relates to rates on hard and soft coal from Duluth and Superior, which are alleged to be prejudicial to Milwaukee.

In the **Perry County Coal Corporation** case, the commission has authorized the **Eldnar Coal Co.**, the **Fullerton Coal Co.**, the **Ruby Coal Co.**, the **Madison County Mining Co.**, the **New National Coal Co.**, the **Groom Coal Co.**, the **General Coal Co.**, the **Oak Hill Coal Co.**, the **O'Fallon Coal Co.**, and the **Peoples Coal Co.**, to intervene. The case relates to rates on coal from mines in Illinois to points in St. Louis and East St. Louis districts.

In the complaint of the **St. Louis Chamber of Commerce**, an I. C. C. examiner recommends that the commodity rates on coke for certain west-side movements within the St. Louis-East St. Louis switching district are unreasonable.

The **French Battery and Carbon Co.**, of Madison, Wis., allege unreasonable rating on ground petroleum coke from Kaulmont, Pa., to Madison.

Freight rates on coal shipped to points within the state of Wisconsin will be investigated by the railroad commission at a series of hearings to open at Madison, Dec. 19. Fourteen railroads are involved in the action of the rate body to establish definitely whether excessive charges on coal from Wisconsin docks occur in the intrastate rail hauls.

Obituary

William B. Hawkins, forty nine years of age, president of the Western Coal and Mining Co., died recently after a long illness. Besides his interest in the Western Coal and Mining Co., he was an executive in other coal mining properties in Illinois and Kansas.

News has been received of the death of **Ed. Funk**, which occurred in Youngstown, Ohio, recently. Mr. Funk was well-known

The **Sugar Creek Coal Co.** is the name of a new company which will operate in the New River field, having its headquarters at Mt. Hope. Coal property on Sugar Creek will be developed. The capital stock has been fixed at \$125,000. Among those interested in the new company are T. A. Dietz, L. W. Sydnor, N. R. Dietz, M. C. Rhodes, all of Charleston; C. W. Dillon of Fayetteville.

ONTARIO

The **Semet Solvay Co.** plans to build a \$3,000,000 gas and coke-oven plant next spring at Hamilton.

In an affidavit filed in reply to the claim of the **Valley Camp Coal Co.**, for \$21,754, alleged to be due on two checks, H. A. Harrington, former fuel controller, Toronto, claims \$20,000 from the plaintiff as damages for the poor quality of coal supplied the parties for whom he ordered.

BRITISH COLUMBIA

Two of the mines of one of the largest producers, the **Canadian Western Fuel Corporation, Ltd.**, Nanaimo, have been closed temporarily. These are the Wakesiah and Herewood mines.

in Birmingham, where he was general coke oven foreman of the byproduct division of the Tennessee Coal, Iron & Railroad Co.

Publications Received

Studies on Cooling of Fresh Concrete in Freezing Weather—Engineering Experiment Station, University of Illinois, Urbana, Ill. Bulletin 123. Pp. 63, 6 x 9 in.; charts and tables.

The Thermal Conductivity and Diffusivity of Concrete—Engineering Experiment Station, University of Illinois, Urbana, Ill. Bulletin 122. Pp. 6 x 9 in.; illustrations and tables.

Production of Explosives in the United States—Department of the Interior, Bureau of Mines. Technical Paper 291. Pp. 44, 6 x 9 in.; charts and tables. Giving details of the manufacture of explosives during 1920, and notes on mine accidents due to explosions.

Permeation of Oxygen Breathing Apparatus by Gases and Vapors—Department of the Interior, Bureau of Mines. Technical Paper 272. Pp. 24; 6 x 9 in. Illustrated; charts and tables.

The Analysis of Sulphur Forms in Coal—Department of the Interior, Bureau of Mines. Technical Paper 254. Pp. 21; 6 x 9 in. Charts and tables.

Trade Catalogs

Representative Plants—Roberts & Schaefer Co., Chicago, Ill. Bulletin 45. Pp. 63; 8½ x 11 in.; illustrated. Description of representative coal mining plants, tipples and washeries erected by the company.—Advertiser.

Marion Excavating Machinery—The Marion Steam Shovel Co., Marion, Ohio. Catalog 190. Pp. 24; 9 x 11 in.; illustrations and tables. Describing the manufacture and use of steam shovels.

Sullivan Displacement Pneumatic Pumps—Sullivan Machinery Co., Chicago, Ill. Bulletin 71-F. Pp. 5; 6 x 9 in.; illustrated. Description of the Sullivan Displacement Pump for elevating acid by compressed air.—Advertiser.

Tube Welding Machinery and Fabricating Equipment—Davis-Bournonville Co., Jersey City, N. J. Pp. 24; 8 x 11 in.; illustrated. Listing machinery for producing welded tubing from commercial steel sheets or rolled strip stock.

Starters for Small A. C. Motors—The Cutler-Hammer Mfg. Co., Milwaukee, Wis. Publication 2038. Pp. 4; 8½ x 11 in.; illustrations and charts. Describing Bulletin 9604 starter with mercury type overload relays.—Advertiser.

A C-P Production for Every Class of Work—Chicago Pneumatic Tool Co., New York, N. Y. Publication 674. Illustrated. Specifications of pneumatic tools.—Advertiser.

OUTPUT FOR OCTOBER, 1921.

Vancouver Island District.

Canadian Western Fuel Co., Nanaimo	64,445
Canadian Collieries (D) Ltd.	
Comox	35,440
South Wellington	8,600
Extension	18,619
Nanosee Wellington Collieries	6,885
Granby Consolidated MS&P Co., Ltd.	24,234
Old Wellington (King & Foster)	513
Total	158,756

Nicola-Princeton District.

Middlesboro Collieries	6,977
Fleming Coal Co., Merritt	3,499
Coalmont Collieries, Coalmont	6,945
Princeton Coal & Land Co.	2,616
Total	19,137

Crow's Nest Pass District.

Crow's Nest Pass Co.	
Coal Creek	36,555
Michel	24,940
Corbin Coal & Coke Co.	5,789
Total	67,284
Total for month	245,177

All properties of the **Pacific Coast Coal Mines, Limited**, consisting of two big mines, one at Morden and one at Suquash, were purchased in a sheriff's sale by **E. B. Ross** of Montreal. The price paid was \$316,100.

Ventilating Fans—Pittsburgh Mining Machinery Co., Pittsburgh, Pa. Publication V-101. Pp. 4; 8½ x 11 in.; illustrated. Description of the company's disc and centrifugal fans.—Advertiser.

Excavating Equipment—Pawling & Harnischfeger Co., Milwaukee, Wis. Bulletin 56X. Pp. 27; 8½ x 11 in.; illustrated. Describing combination of machines in P. & H. Excavators, Nos. 205 and 206.

Stop Drilling Shot Holes by Hand—Chicago Pneumatic Tool Co., New York, N. Y. Publication 482. Description of the use of power operated pneumatic and electric tools in mines.—Advertiser.

American Air-Tight Doors—Conveyors Corporation of America, Chicago, Ill. Folder, describing cast iron door, suitable for ash pits, boiler settings, coke ovens, etc.

Sterling Transits and Levels—Warren-Knight Co., Philadelphia, Pa. Pp. 32; 4 x 7 in.; illustrated. Contains description and prices.

Association Activities

Morgantown Wholesale Coal Association

An interesting meeting of the Morgantown Wholesale Coal Association was held at Morgantown in November. Dr. A. C. Callen, of Morgantown, head of the mining engineering department of the West Virginia University, related the results of several tests in coal washing which had been conducted last spring. Dr. Callen explained the result of his tests in detail.

Before the close of the meeting a resolution was adopted by the association advocating an early reduction in freight rates in general.

Coming Meetings

The **American Institute of Consulting Engineers, Inc.**, will hold its annual meeting Jan. 16, 1922, at the Engineers' Club, 32 West 40th St., New York City, Secretary F. A. Molitor, 35 Nassau St., New York City.

New England Wholesale Coal Association will hold its annual meeting Jan. 10, 1922, at Boston, Mass. Secretary, R. S. Townsend, 27 Kilby St., Boston, Mass.

Southern Appalachian Coal Operators' Association will hold its next meeting Jan. 27, 1922, at Knoxville, Tenn. Secretary, J. E. McCoy, Knoxville, Tenn.

Pike County Coal Operators will hold their annual meeting Jan. 6, 1922, at Pikeville, Ky. Secretary, F. E. Miller, Pikeville, Ky.

American Society of Mechanical Engineers will hold its annual meeting Dec. 5-9 at the Engineering Societies' Building, 29 West 39th Street, New York City. Secretary Calvin W. Rice, 29 West 39th Street, New York City.